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Patient Safety, Fall 2020 Cycle: CDP Report

DRAFT REPORT FOR CSAC REVIEW
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Contents

Executive Summary

The National Quality Forum (NQF) has been dedicated to the measurement and improvement of patient safety for more than two decades. NQF's Patient Safety Standing Committee has vetted and endorsed dozens of patient safety measures across conditions and settings. Examples include measures of in-hospital mortality and preventable complications, including central line-associated blood stream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), falls, pressure ulcers, and other outcomes across a variety of settings. The Patient Safety Standing Committee also maintains process measures, including medication reconciliation, sepsis care, nursing staffing ratios, and others. Many measures endorsed by NQF's Patient Safety Standing Committee appear in public reporting and payment programs. Patient safety measurement efforts have led to large improvements in care and outcomes across settings and through promoting a focus on evidence-based quality improvement efforts.

In this project, the Standing Committee evaluated six measures undergoing maintenance review against NQF's standard evaluation criteria. Measures focused on several patient safety processes and outcomes. One measure focused on medication reconciliation, the process by which a clinician reviews a patient's medications to identify and resolve issues (e.g., conflicting medications), and ensuring that newly prescribed medications do not conflict with current medications. Two measures focused on medication prescribing in older adults, namely avoiding specific medications that may lead to harmful adverse events and avoiding medications with potentially unsafe drug-drug interactions. Two measures focused on risk-adjusted inpatient mortality for pneumonia and chronic obstructive pulmonary disease (COPD). Finally, a composite measure of in-hospital harm was reviewed, which brings together 10 separate measures of observable complications across several conditions. The Standing Committee ultimately recommended five measures for endorsement and one was consensus not reached.

Several general themes emerged from the Standing Committee's discussion. One overarching issue was the importance of linking process measures to outcomes. Specifically, there were concerns that two of the measures reviewed (medication reconciliation and prescribing potentially inappropriate medication in older adults) did not have sufficient evidence to justify measurement. Other issues included some concerns and questions regarding robust risk adjustment, which is vitally important as outcome measures gain an increasingly central role in quality measurement.

The measures recommended for endorsement are listed below:

- #0022 Use of High-Risk Medications in Older Adults (DAE) (National Committee for Quality Assurance (NCQA))
- #0468 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Pneumonia Hospitalization (Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (Yale CORE))
- #0531 Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite (IMPAQ International)

- #1893 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization (Yale CORE)
- #2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE) (National Committee for Quality Assurance (NCQA)

The measure in which consensus was not reached is listed below:

- #0097 Medication Reconciliation Post-Discharge (NCQA)

Brief summaries of the measures currently under review are included in the body of the report; detailed summaries of the Standing Committee's discussion and ratings of the criteria for each measure are in Appendix A.

Introduction

The 1999 Institute of Medicine report entitled *To Err Is Human* described morbidity and mortality associated with preventable harms from medical errors. The report estimated that nearly 100,000 U.S. deaths per year were attributable to medical errors.[1] More recent evidence has estimated that errors may account for as many as 251,000 deaths annually in the U.S., making medical errors the third leading cause of death.[2,3] These sobering figures have sparked a national focus on identifying, studying, and improving patient safety across medical settings.

NQF has been dedicated to the measurement and improvement of patient safety. Through its Consensus Development Process (CDP), NQF's Patient Safety Standing Committee has vetted and endorsed dozens of measures in patient safety across a variety of conditions and settings. This includes measures for mortality and preventable complications, including CLABSI, CAUTI, sepsis care, falls, pressure ulcers, and other outcomes. In addition, the Patient Safety Standing Committee vets process measures, such as medication reconciliation intended to lower medical error rates, and structural measures for nursing staffing ratios and nursing case-mix, which are intended to right-size hospital staffing.

Many measures endorsed by NQF's Patient Safety Standing Committee appear in public reporting and payment programs. For example, the Centers for Medicare & Medicaid Services (CMS) has used a sepsis quality measure maintained by NQF's Patient Safety Standing Committee as part of its Hospital Inpatient Quality Reporting Program since 2015.[4] This measure requires hospitals to report compliance with three- and six-hour treatment and resuscitation targets for sepsis, which is a time-sensitive and lethal condition. Targets include antibiotic and fluid administration, blood lactate and blood culture measurement, vasopressor use in fluid-refractory hypotension, and evaluation of a patient's treatment responses. The goal is to ensure that hospitals deliver guideline-concordant sepsis care and improve outcomes.[5]

Over the last two decades, the process of patient safety measurement has improved care and outcomes in several conditions. One notable example is the improvements in CLABSI in hospitals. By holding hospitals accountable for CLABSI, hospitals have implemented various interventions to improve CLABSI rates. Effective interventions used in healthcare settings to reduce CLABSI include improved hand hygiene, chlorhexidine skin antisepsis, maximal sterile barrier precautions, optimal catheter site selection, and daily line reviews.[6] By instituting these interventions, a significant drop in CLABSI was observed from 2006 to 2016 with a fall in the standardized infection ratio from 1.00 to 0.56 in a national sample of data from the National Healthcare Safety Network (NHSN) and the Centers for Disease Control and Prevention (CDC).[7] More recent literature has also demonstrated continued efforts in hospitals to reduce CLABSI.[8–10]

During this cycle, the Patient Safety Standing Committee reviewed measures related to medication reconciliation, the process of reviewing medications. In addition, the Standing Committee reviewed measures related to medications to be avoided and specific harmful drug-drug interactions in older adults. The Standing Committee also reviewed risk-adjusted, in-hospital mortality measures for

pneumonia and COPD. Finally, the Standing Committee reviewed a composite measure of in-hospital complications.

NQF Portfolio of Performance Measures for Patient Safety Conditions

The Patient Safety Standing Committee (Appendix C) oversees NQF's portfolio of Patient Safety measures (Appendix B), which includes measures for various subtopics. This portfolio contains 58 measures: 35 outcome and resource use measures, 16 process measures, three composite measures, three structure measures, and one intermediate outcome measure (see table below).

Table 1. NQF Patient Safety Portfolio of Measures

Subtopic	Process	Outcome/Resource Use	Intermediate Outcome	Structure	Composite	Total
Medication Safety	8	1	0	0	0	9
Healthcare-Associated Infections	2	7	0	0	0	9
Perioperative Safety	0	7	0	0	0	7
Falls	1	3	0	0	0	4
Mortality	0	7	0	0	1	8
Venous Thromboembolism	0	1	0	0	0	1
Pressure Ulcers	0	3	0	0	0	3
Workforce	0	0	0	3	0	3
Radiation Safety	0	0	1	0	0	1
Other	5	6	0	0	2	13
Total	16	35	1	3	3	58

Additional measures relevant to patient safety have been assigned to other portfolios. These include care coordination measures (Geriatrics and Palliative Care), imaging efficiency measures (Cost and Efficiency), and a variety of condition- or procedure-specific outcome measures (Cardiovascular, Cancer, Renal, etc.).

Patient Safety Measure Evaluation

During the intent to submit period from August 3, 2020, to November 2, 2020, eight maintenance measures were submitted for the fall 2020 cycle. Two measures, NQF #0022 *Falls With Injury* and NQF #0141 *Patient Fall Rate*, originally under review, did not pass on validity by the Scientific Methods Panel (SMP). The Standing Committee has the option to select measures for reconsideration/voting to overturn the SMP's evaluation, even if they do not pass the SMP's review. These measures were not pulled by the Patient Safety Standing Committee for discussion, and therefore, they were not recommended for endorsement.

On February 10, 2021, the Patient Safety Standing Committee evaluated six measures undergoing maintenance endorsement review against NQF's standard measure evaluation criteria.

Table 2. Patient Safety Measure Evaluation Summary

Measures	Maintenance	New	Total
Measures under review*	8	0	8
Measures recommended for endorsement	5	0	5
Measures where consensus was not reached†	1	0	1
Reasons for not recommending	Importance – 0 Scientific Acceptability – 2 Use – 0 Overall Suitability – 0 Competing Measure – 0	Importance – 0 Scientific Acceptability – 0 Overall Suitability – 0 Competing Measure – 0	- -

*Two measures, NQF #0022 *Falls With Injury* and NQF #0141 *Patient Fall Rate*, did not pass on validity by the SMP. These measures were not pulled by the Patient Safety Standing Committee for discussion, and therefore, they were not recommended for endorsement.

†An error in the validity vote (a must-pass criterion) was determined for NQF #0097 prior to CSAC review, in which the measure was stated as "passing on validity", when in fact, the vote score is Consensus Not Reached. The vote tally is as follows: **Total Votes-23; High-0; Moderate-13; Low-8; Insufficient-2 (57% passing votes)**. Therefore, the measure has not achieved consensus on a must-pass criterion. In normal operations, the Standing Committee would have re-voted on this criterion during the post-comment meeting and, at that time, if consensus was not reached it would not have been recommended for endorsement. However, the error was discovered after the post-comment meeting, and it was not possible to re-convene the Standing Committee again. Therefore, NQF is allowing the measure to retain endorsement and the Standing Committee will revote on validity and the overall suitability for endorsement during the Fall 2021 cycle.

Comments Received Prior to Standing Committee Evaluation

NQF accepts comments on endorsed measures on an ongoing basis through the Quality Positioning System (QPS). In addition, NQF solicits comments for a continuous 16-week period during each evaluation cycle via an online tool located on the project webpage. For this evaluation cycle, the commenting period opened on December 15, 2020. The pre-evaluation commenting period closed on January 15, 2021. Six comments were submitted and shared with the Standing Committee prior to the measure evaluation meeting (Appendix F).

Comments Received After Standing Committee Evaluation

The continuous 16-week public commenting period with NQF member support closed on April 23, 2021. Following the Standing Committee's evaluation of the measures under review, NQF received 15

comments from five organizations (including four member organizations) and individuals pertaining to the draft report and to the measures under review. All comments for each measure under review have been summarized in Appendix A.

Throughout the 16-week continuous public commenting period, NQF members had the opportunity to express their support ('support' or 'do not support') for each measure submitted for endorsement consideration to inform the Standing Committee's recommendations. Four NQF members provided their expression of support.

Overarching Issues

During the Standing Committee's discussion of the measures, several overarching issues emerged that were factored into the Standing Committee's ratings and recommendations for multiple measures and are not repeated in detail with each individual measure.

Importance of Linking Process to Outcomes

The Standing Committee discussed the importance of linking care processes to outcomes as an important criterion for performance measurement. In particular, the discussion on the medication reconciliation measure focused on this topic. There were concerns that a process that does not have good evidence to support a linkage to improved outcomes, specifically "checkbox" measures that are now facilitated by electronic health records (EHRs), should be scrutinized carefully. In the future, measures of outcomes may be more appropriate. For example, outcomes of medication reconciliation may include rates of medical errors due to drug-drug interactions. This same issue was also raised, and it explains why the Standing Committee did not reach consensus on the measure for high-risk medication use in the elderly. These were seen by the Standing Committee as "best practice" recommendations rather than specific medications that had been linked to poorer outcomes in older adults. By contrast, there was less concern measuring drug-drug interactions when there is clearer evidence that it should be avoided.

Appropriate Risk Adjustment

In several measure discussions, risk adjustment was discussed. In particular, measures that use covariates to adjust measure scores should use confounding variables to ensure that accountable entities are compared appropriately. Specific examples that were mentioned include adjusting for transfers for patients admitted to the hospital from skilled nursing facilities or other long-term care facilities and risk-adjusting for social risk factors. These are the social conditions that may influence health outcomes as much as, or more than, medical care does, including socioeconomic position/status (e.g., income, education, and occupation); race/ethnicity and cultural context; gender; social relationships; and residential and community context, as well as health literacy.[11] The Standing Committee appreciates the importance of social determinants of health and considering those factors within measurement. It also recognizes that there are limitations in the data that are available to effectively adjust for social risk factors and will continue to evaluate measures and more approaches to adjusting for social risk factors as they become available.

Summary of Measure Evaluation

The following brief summaries of the measure evaluation highlight the major issues that the Standing Committee considered. Details of the Standing Committee's discussion and ratings of the criteria for each measure are included in Appendix A. Quorum, which is defined as attendance of 66 percent of active Standing Committee members, and for which this would be 17 out of 25 for the Patient Safety Standing Committee, was achieved and maintained throughout the call on February 10, 2021.

#0022 Use of High-Risk Medications in Older Adults (DAE) (National Committee for Quality Assurance): Recommended

Description: The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance.; **Measure Type**: Process; **Level of Analysis**: Health Plan; **Setting of Care**: Outpatient Services; **Data Source**: Claims

The Standing Committee did not reach consensus for evidence in this measure and will re-vote during the post-comment meeting on June 4, 2021. There were no comments received for this measure prior to the Standing Committee's evaluation. Consensus was not reached because the Standing Committee had several concerns regarding the list of medications being referred to as a list of "best practice" recommendations rather than sufficient evidence to link their use directly to clinical outcomes. The measure is based on the American Geriatrics Society's (AGS) Beers criteria, which include drugs that are potentially inappropriate to prescribe in older adults. Some Standing Committee members also raised concern that the measure included those medications that possessed low-grade evidence. The developer clarified that some medications are included in the measures with low-grade evidence. Other Standing Committee members mentioned that the Beers criteria are endorsed by the AGS and although there is evidence that some of these drugs are harmful, they are not widely used anymore. The Standing Committee recognized that there are exceptions to the use of some of these medications in practice due to the limited choices available for the patient and that this measure should be encouraging providers to avoid these high-risk medications when other options available. Beyond evidence, other parts of the measure discussion did not raise substantial concerns by the Standing Committee. Performance gap data were presented for the measure, and the Standing Committee agreed to pass the measure based on these data. There were also no concerns raised regarding the reliability of this measure. The only concern noted on the validity of the measure was further discussion regarding the use of a 90-day supply for non-benzodiazepines within the measure, as this was not reflected in the Beers criteria. The developer mentioned that in the previous Beers criteria recommendations, non-benzodiazepines were recommended to be avoided beyond 90 days. In the 2019 update, the recommendation changed to avoiding them altogether. However, the developer mentioned that their Technical Expert Panels (TEPs) were concerned that eliminating non-benzodiazepines from the measure may subsequently turn providers more toward benzodiazepines, which are also recommended to be avoided. The Standing Committee did not raise any concerns regarding the feasibility or use and usability of the measure.

During the post-comment discussions, the Standing Committee reviewed and discussed the comments received during the public commenting period, which were all supportive of the measure, citing the measure's potential in the prevention of medication-related harm in elderly patients. The Standing Committee discussed the evidence to support the list of medications used within the measure. The developer stated that this measure relies on the Beers' criteria, which was determined by the AGS

guideline, which had graded the evidence behind each of the medications. The developer then clarified that they had gone through a process to update the evidence about five years ago and has continued to do so in a similar fashion. Considering this information, the Standing Committee revoted and passed the measure on the evidence criterion and the overall recommendation for endorsement.

#0097 Medication Reconciliation Post-Discharge (National Committee for Quality Assurance): Recommended

Description: The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).; **Measure Type**: Process; **Level of Analysis**: Health Plan; **Setting of Care**: Outpatient Services; **Data Source**: Claims, Electronic Health Records, Paper Medical Records

During the measure evaluation meeting on February 10, 2021, the Standing Committee did not pass this measure on evidence. No comments were received for this measure prior to the Standing Committee's evaluation. The Standing Committee's major concern was that insufficient evidence was submitted by the developer to link the process of medication reconciliation to related outcomes (e.g., medical errors). There were also concerns that this measure identifies whether medication reconciliation was documented (i.e., a box was checked) rather than assessing the quality of the reconciliation process or whether medication discrepancies were resolved. In the discussion on evidence, the Standing Committee also pointed out that the developer did not assess the quality, quantity, and consistency of the evidence; therefore, NQF staff's preliminary rating was "insufficient" with regard to evidence. A Standing Committee member also identified a 2018 Cochrane report that did not demonstrate evidence of a link between medication reconciliation and outcomes.[12]

During the February 10, 2021 measure evaluation meeting, NQF staff clarified consensus voting thresholds that are needed to pass the measure on evidence, which are based on the number of Standing Committee members present on the call and eligible to vote. NQF staff noted on the call that the Standing Committee did not reach consensus on evidence, which caused the Standing Committee to proceed with reviewing the measure against the remaining NQF criteria. However, during a final review of the numbers after the call, it was identified that the measure did not pass on evidence (H-0; M-8; L-4; I-11 (23 votes total)). NQF staff and the Standing Committee Co-Chairs suggested that due to the lack of clarity on the voting thresholds during the call, the evidence criterion will proceed with a revote during the post-comment meeting on June 4, 2021.

A performance gap was presented for the measure, and the Standing Committee agreed to pass the measure based on these data. There were also no concerns raised regarding the reliability of this measure. Regarding the validity of the measure, Standing Committee members raised concern that this measure is an example of a "checkbox" measure that is easy to achieve in the EHR without a clear linkage to care management or outcomes. During the February 10, 2021, measure evaluation meeting, it was stated that the Standing Committee passed the measure on validity, which caused the Standing Committee to continue with its review of this measure.* The Standing Committee did not raise any concerns regarding the feasibility or the use and usability of the measure.

During the post-comment discussions, the Standing Committee reviewed and discussed the comments received during the public commenting period, which were all supportive in continuing measurement of medication reconciliation, particularly until more robust measures of medication-related outcomes could be developed. Additionally, there was a comment that noted the success of medication reconciliation in reducing medication discrepancies at discharge. Finally, there was a supportive comment about medication reconciliation to ensure patient safety and continuity of care post-discharge. During the Standing Committee discussion, there were expressions of support for the measure, describing the importance of medication review from a recent JAMA article. Some Standing Committee members commented that lack of medication reconciliation is a significant risk factor for readmission to the hospital in a large rehabilitation setting. One Standing Committee member shared that medication reconciliation is performed daily by pharmacists, and did in his personal experience, result in catching medication errors. Based on this discussion and review of public comments, the Standing Committee revoted and passed the measure on evidence and the overall suitability for endorsement.

*After the June 4, 2021 post-comment meeting, it was determined that there was an error in the validity vote (a must-pass criterion), which occurred during the measure evaluation meeting for NQF #0097. During the February 10, 2021 meeting, it was stated that NQF #0097 "passed on validity", when in fact, the vote score is Consensus Not Reached. The vote tally is as follows: Total Votes-23; High-0; Moderate-13; Low-8; Insufficient-2 (57% passing votes rather than >60%). In normal operations, the Standing Committee would have re-voted on this criterion during the post-comment meeting and, at that time, if consensus was not reached it would not have been recommended for endorsement. However, the error was discovered after the post-comment meeting and it was not possible to re-convene the Standing Committee again. Therefore, NQF is allowing the measure to retain endorsement and the Standing Committee will revote on validity and the overall suitability for endorsement during the Fall 2021 cycle.

#0468 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Pneumonia Hospitalization (Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (Yale CORE): Recommended

Description: The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.; **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Inpatient/Hospital; **Data Source**: Claims, Enrollment Data, Other

The Standing Committee recommended the measure for continued endorsement. The Standing Committee did not raise any concerns with the importance of the measure, noting that there was good evidence indicating that one or more healthcare actions could influence this measure and that sufficient performance gaps exist. This measure was deemed as complex and was evaluated by the SMP with a high rating of reliability and a moderate rating of validity. The Standing Committee unanimously

upheld the SMP's decision to pass the measure on reliability but showed some concern with the large range for reliability scores and that only a 25-case volume threshold was utilized. The Standing Committee also upheld the SMP's decision to pass the measure on validity but did express that this measure may not be appropriately adjusted to account for source of admission. The developer clarified that source of admission was not utilized because historically, this field in claims was not audited. The Standing Committee raised no concerns with the feasibility or the use and usability of the measure. There were two public comments received that raised concerns: (1) some hospitals have low reliability on this measure despite meeting the minimum threshold of 25 cases, well below the threshold of 0.7, and (2) the measure does not adjust for social risk factors. Comments received during the public commenting period were not supportive of the measure due to concerns around reliability threshold and intraclass correlation coefficients at the minimum sample size and a lack of inclusion of social risk factors in the risk adjustment model.

During the public comment period, commenters expressed non-support due to concerns about the reliability threshold and intraclass correlation coefficients at the minimum sample size. A second concern was surrounding the lack of inclusion of social risk factors in the risk adjustment model. The Standing Committee and the NQF SMP previously considered the scientific acceptability, including the reliability testing, the risk adjustment model, and the consideration of social risk factors. The Standing Committee agreed that social risk factors, including community and personal factors, can have a strong impact on certain outcomes and are important to consider. However, there are limitations in data regarding social risk within current data environments. The Standing Committee then broadly agreed about the importance of social risk factors within measurement, acknowledging that they should be considered by developers and agreed that the developer for this measure had demonstrated that they were indeed not needed in this case. Furthermore, the Standing Committee reviewed this information during the measure evaluation meetings and voted to recommend this measure for endorsement. There were no objections from Standing Committee members to the developer responses, nor any requests to reconsider or revote on this measure.

#0531 Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite (IMPAQ International): Recommended

Description: The PSI 90 composite measure summarizes patient safety across multiple indicators for the CMS Medicare fee-for-service population.; **Measure Type**: Composite; **Level of Analysis**: Facility; **Setting of Care**: Inpatient/Hospital; **Data Source**: Claims

The Standing Committee recommended the measure for continued endorsement. However, several issues were raised throughout the discussion with the Standing Committee. More specifically, the Standing Committee raised some concerns about the lack of risk adjustment for social risk factors. The developer responded by explaining that this is a hospital measure in which outcomes would be less affected by social risk factors. Nonetheless, the Standing Committee largely supported the developer's submission. A vast amount of evidence was submitted by the developer, updating the evidence for each of the individual 10 components of the measure, each of which has its own evidence base. Standing Committee members felt that this was very appropriate. The Standing Committee also agreed that a performance gap for the measure exists and that the quality construct was appropriate. More specifically, providing a weighted measure of in-hospital complications made sense. Each element is

individually important, yet the combined effect is to measure overall complication rates in hospitals. The SMP reviewed the measure prior to the Standing Committee's meeting and rated reliability as moderate, which the Standing Committee unanimously accepted. The SMP felt that reliability testing was appropriately conducted and reliability results for the composite measure were adequate. However, the SMP noted concerns over the wide variation in reliability for individual component measures, with some measures having low reliability and with no analysis of how this may affect the reliability of the composite measure. One Standing Committee member raised an issue regarding how large academic hospitals compared with smaller academic hospitals with regard to elective procedures. The developer replied by confirming that this idea is actively being explored as well as alternative approaches to defining elective admissions. The developer also noted that out of 10 components, only three use the term "elective" in their specifications. Some concerns were raised with the validity of the measure, with Standing Committee members questioning whether the measure risk-adjusted for patients admitted from long-term care or skilled nursing facilities. The developer confirmed that the measure adjusts for transfer-in status in all the models, but the term "transferring in" of patients may vary across hospitals, thus leading to complexities. One issue raised by a Standing Committee member was more general in context. Specifically, the member saw the measure as representing a convenience sample of observable patient safety events rather than emanating from a comprehensive evaluation of events that lead to harm. The Standing Committee member urged CMS to consider such an approach in future iterations of the measure. Ultimately, the Standing Committee accepted the SMP's moderate rating for validity. The SMP rated the measure as moderate given concerns of the weak correlation and Care Compare infection-related outcomes as well as other measures that should be conceptually linked to a composite measure of complications. Given that the measure originates from claims data, which are widely available, and that the measure is used in public programs, no concerns were raised over feasibility or the use and usability of the measure. Standing Committee members were also particularly pleased with the developer, who has been very responsive to feedback from the Standing Committee and has worked to continuously improve the measure over time. During the last few times the Standing Committee reviewed the measure, specific issues were raised regarding measure specifications and measure construction, which ultimately resulted in an improved measure that more accurately captures the quality construct. There were two public comments received that raised concerns: (1) some hospitals have low reliability on some components of the composite despite meeting the minimum threshold of 25 cases, well below the threshold of 0.7, and (2) the measure does not adjust for social risk factors. There were also concerns from the SMP's discussion that the argument to exclude social risk factors was illogical.

During the public comment period, commenters expressed non-support due to concerns about the reliability threshold and intraclass correlation coefficients at the minimum sample size. Commenters were also concerned about the lack of inclusion of social risk factors in the risk adjustment model and the measure of Post-Surgical Hip Fracture being used as the only representative measure of falls with injury. The developer described in their responses that the post-surgical fall measure had been expanded in the last round of development to include post-surgical as well as medical patients. Lastly, there was a concern was surrounding the lack of inclusion of social risk factors in the risk adjustment model. The Standing Committee and the NQF Scientific Methods Panel previously considered the scientific acceptability, including the reliability testing, the risk adjustment model, and the consideration

of social risk factors. The Standing Committee agreed that social risk factors, including community and personal factors, can have a strong impact on certain outcomes and are important to consider. However, there are limitations in data regarding social risk within current data environments. The Standing Committee then broadly agreed about the importance of social risk factors within measurement, acknowledging that they should be considered by developers and agreed that the developer for this measure had demonstrated that they were indeed not needed in this case. Furthermore, the Standing Committee reviewed this information during the measure evaluation meetings and voted to recommend this measure for endorsement. There were no objections from Standing Committee members to the developer responses, nor any requests to reconsider or revote on this measure.

#1893 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization (Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (Yale CORE): Recommended

Description: The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.; **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Inpatient/Hospital; **Data Source**: Claims, Enrollment Data, Other

The Standing Committee recommended the measure for continued endorsement. The Standing Committee voted unanimously to pass the measure on the evidence criterion based on the strength of the evidence in measuring differences in quality, along with literature reviews supporting the use of interventions in reducing COPD mortality. The Standing Committee did not express any concerns with the performance gap of the measure. The Standing Committee voted to accept the SMP's moderate rating for reliability. The SMP rated reliability as moderate because while the median reliability was 0.72, which is acceptable, there was large variation in reliability scores across hospitals (ranging from 0.32 to 0.97). For validity, a Standing Committee member asked what would happen to the numerator for a COPD primary diagnosis if the patient had multiple admissions with multiple diagnoses. The developer replied, stating that one diagnosis would be chosen randomly from a period. The Standing Committee voted to uphold the SMP's decision to give a moderate rating for measure validity. Specific concerns about the validity of this measure that only six percent of hospitals are identified as outliers on this measure and that the measure itself possessed a negative correlation with hospital stars ratings, which would be expected to be correlated positively. The Standing Committee identified no concerns regarding the feasibility or the use and usability of this measure. There were two public comments received that raised concerns: (1) some hospitals have low reliability on this measure despite meeting the minimum threshold of 25 cases, well below the threshold of 0.7, and (2) the measure does not adjust for social risk factors.

During the public comment period, commenters expressed non-support due to concerns about the reliability threshold and intraclass correlation coefficients at the minimum sample size. A second

concern was surrounding the lack of inclusion of social risk factors in the risk adjustment model. The Standing Committee and the NQF SMP previously considered the scientific acceptability, including the reliability testing, the risk adjustment model, and the consideration of social risk factors. The Standing Committee agreed that social risk factors, including community and personal factors, can have a strong impact on certain outcomes and are important to consider. However, there are limitations in data regarding social risk within current data environments. The Standing Committee then broadly agreed about the importance of social risk factors within measurement, acknowledging that they should be considered by developers and agreed that the developer for this measure had demonstrated that they were indeed not needed in this case. Furthermore, the Standing Committee reviewed this information during the measure evaluation meetings and voted to recommend this measure for endorsement. There were no objections from Standing Committee members to the developer responses, nor any requests to reconsider or revote on this measure.

#2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE) (National Committee for Quality Assurance): Recommended

Description: The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure:

- Rate 1: The percentage of those with a history of falls that received a potentially harmful medication
- Rate 2: The percentage of those with dementia that received a potentially harmful medication
- Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication

A lower rate represents better performance for all rates.; **Measure Type**: Process; **Level of Analysis**: Health Plan; **Setting of Care**: Outpatient Services; **Data Source**: Claims

The Standing Committee recommended the measure for continued endorsement. There were no comments received for this measure prior to the Standing Committee's evaluation. The Standing Committee did not raise any concerns regarding the evidence or performance gap for this measure. The Standing Committee also did not have any questions or concerns for reliability. For validity, a Standing Committee member asked how the history of falls was captured, specifically what was the lookback period. The developer stated that the lookback period was two years and that falls are identified through various value sets, a falls value set, and hip fractures as a proxy. The Standing Committee did not raise any further questions or concerns and passed the measure on validity. The Standing Committee also did not have any questions or concerns related to feasibility. Moving on to use and usability, a Standing Committee member asked whether there is a threshold to consider when looking at improvement over time for the usability criterion. NQF staff mentioned that there is no threshold to be met for improvement over time, as this is dependent on the context of use for the measure, namely when and how it is used, how long it is used, and any updates to the measure. The Committee did not have any further questions and passed the measure on use and usability. One comment received during the public commenting period was supportive of the measure, noting that drug-disease interactions in

the setting of a history of falls, dementia, and chronic kidney disease warrant performance measurement and continued prioritization in outpatient settings.

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Appendix A: Details of Measure Evaluation

Rating Scale: H=High; **M**=Moderate; **L**=Low; **I**=Insufficient; **NA**=Not Applicable

Note: Vote totals may differ between measure criteria and between measures as Standing Committee members often have to join calls late or leave calls early. NQF ensures that quorum is maintained for all live voting. All voting outcomes are calculated using the number of Standing Committee members present for that vote as the denominator. Quorum for the Patient Safety Standing Committee is 17 out of 25 members.

Measures Recommended

#0022 Use of High-Risk Medications in Older Adults (DAE)

Submission | Specifications

Description: The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance

Numerator Statement: Patients who received at least two dispensing events for the same high-risk medication during the measurement year.

Denominator Statement: All patients 65 years of age and older.

Exclusions: Patients who were enrolled in hospice care at any time during the measurement year.

Adjustment/Stratification: No risk adjustment or risk stratification

Level of Analysis: Health Plan

Setting of Care: Outpatient Services

Type of Measure: Process

Data Source: Claims

Measure Steward: National Committee for Quality Assurance

STANDING COMMITTEE MEETING February 10, 2021

1. **Importance to Measure and Report: The measure meets the Importance criteria.**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Total Votes-2**1; **H-1; M-10; L-7; I-3**; 1b. Performance Gap: **Total Votes-23**; **H-5; M-15; L-3; I-0**

Post-Comment Revote: 1a. Evidence: **Total Votes-17; H-0; M-13; L-3; I-1; Rationale**:

Evidence

- The Standing Committee noted that the developer provided updated evidence and considered a logic model linking older adults at risk of adverse drug events to clinicians prescribing potentially harmful medications, selecting alternative pharmacologic and non-pharmacologic treatment approaches, when possible, thus avoiding adverse drug events, which leads to reduction in morbidity and mortality.
- The list of medications used in this measure has been updated to reflect the most current recommendations included in the AGS 2019 Updated Beers Criteria for Potentially Inappropriate

Medication Use in Older Adults, and guiding principles on which medications would be included in the measure were also provided.

- The Standing Committee questioned whether the medications for use within the measure included those listed in the Beers criteria (namely Table 2 of the Beers criteria) that had low-grade evidence, noting also that the Beers criteria do not consider medication dosage. The developer clarified that some medications are included in the measures with low-grade evidence and that that they do not anticipate these rates being perfect, as there are patient-level nuances and clinical decision making that occur.
- Some Standing Committee members mentioned that the Beers criteria are endorsed by the AGS and although there is evidence that some of these drugs are harmful, they are not widely used. Another Standing Committee member commented that there are exceptions to the use of some of these medications in practice because there are no alternative choices for the patient.
- Ultimately, the Standing Committee did not reach consensus for evidence as there were several concerns about the list of medications being a list of "best practice" recommendations rather than sufficient evidence to link their use directly to clinical outcomes.

Performance Gap

- The Standing Committee considered performance gap data, including summarized data extracted from the HEDIS data collection for Medicare Advantage Health Plans (including all HMO and PPO plans) from 2016 to 2018, indicating the average performance increased from 9.1% in 2016 to 9.6% in 2018 with an average eligible population of 25,642 and 28,463, respectively.
- The Standing Committee inquired about any change in performance since the previous endorsement evaluation, to which the developer informed them of no change.
- Regarding disparities, the Standing Committee considered a cross-sectional study examining the prevalence of potentially inappropriate medications in community-dwelling Medicare beneficiaries in California, which found that use was significantly higher in women, White beneficiaries, and low-income beneficiaries. Also considered was a retrospective cohort study of 966,000 men and women treated by the Veteran's Health Administration (VHA), indicating that women were more likely than men to receive medications that may have harmful interactions with chronic conditions as described by the Beers Criteria.
- The Standing Committee passed the measure on performance gap.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria.

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity
2a. Reliability: **Total Votes-21**; **H-8; M-11; L-2; I-0**; 2b. Validity: **Total Votes-17**; **H-2; M-10; L-5; I-0**

Rationale:

Reliability

- The Standing Committee considered the reliability testing, which was conducted at the performance measure score level utilizing the beta-binomial model to calculate signal-to-noise reliability.
- With a reliability estimate of 0.936 and 95% CI (0.924, 0.947), this estimate indicated very good reliability for the measure.
- The distribution of plan-level signal-to-noise reliability estimates range from 0.193 to 1.000. The 50th percentile is 0.988.
- The Standing Committee raised no questions or concerns regarding reliability and passed the measure on reliability.

Validity

- The Standing Committee considered validity testing, which was conducted by exploring whether NQF #0022 *Use of High-Risk Medications in Older Adults* correlated with NQF #2993 *Potentially Harmful Drug-Disease Interactions in Older Adults*.
- The correlations were assessed using a Pearson correlation test; it was reported that all correlations were significant at $p<0.001$.
- The Standing Committee questioned the use of a 90-day supply for non-benzodiazepines within the measure, as this was not reflected in the Beers criteria.
- The developer noted previous Beers criteria recommendations for non-benzodiazepines to be avoided beyond 90 days, which was then updated in 2019 with the recommendation to avoid them completely. However, the developer further noted that their Technical Expert Panels (TEPs) were concerned that eliminating non-benzodiazepines from the measure may subsequently turn providers more toward benzodiazepines, which are also recommended to be avoided.
- The Standing Committee passed the measure on validity.

3. Feasibility: Total Votes-17; **H-10; M-6; L-1; I-0**

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee considered that this measure uses pharmacy claims data and did not raise any questions or concerns.
- The Standing Committee passed the measure on feasibility.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Total Votes-19**; **Pass-17; No Pass-2** *4b. Usability:* **Total Votes-22**; **H-11; M-5-; L-6; I-0**

Rationale:

- Regarding use, the Standing Committee noted that this measure is currently used in the Quality Payment Program (QPP), which is a reporting program that uses a combination of incentive payments and payment adjustments to promote the reporting of quality information by eligible

professionals (EPs). This program is also used in scoring for the accreditation of Medicare Advantage Health Plans, to calculate health plan ratings which are reported on the NCQA website, and is publicly reported nationally and by geographic regions in the NCQA State of Health Care annual report.

- Regarding usability, the Standing Committee considered that the average performance in 2018 was 9.6%. There was a 9-percentage point difference between plans at the 10th and 90th percentiles, which represents a persistent gap in care and room for improvement in medication safety for older adults, particularly given the substantially large average denominator size of all plans reporting on this measure, and therefore, the great number of older adults at risk for adverse drug events.
- The Standing Committee also considered that although overall rates are not changing, there has been an increase in the number of plans reporting from 2016-2018.
- The developer identified a potential harm for the Standing Committee's consideration: Poor implementation could lead to reduced access to medications. The developer also noted that there will always be individual cases that will warrant the use of a potentially harmful medication for clinicians to weigh the risks and benefits.
- The Standing Committee questioned whether performance data is shared with the prescriber, to which the developer responded that this is a health plan-level measure; however, some health plans implement system interventions to identify events.
- The Standing Committee also indicated that the use of high-risk medications is a safety edit in place to identify and push notifications to prescribers.
- The Standing Committee voted to pass the measure on use and usability.

5. Related and Competing Measures

- This measure is related to #2993 *Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)*.
- The Standing Committee reviewed and acknowledged that this measure has been appropriately harmonized. No competing measures were noted.

6. Standing Committee Recommendation for Endorsement: **Total Votes-17; Y-15; N-2**

Rationale:

- During the post-comment meeting, the Standing Committee voted to recommend this measure for endorsement.

7. Public and Member Comment

- NQF received three supportive post-evaluation comments on measure 0022.
- Commenters cited the measure's potential in the prevention of medication-related harm in elderly patients.

8. Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X

9. Appeals

#0468 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Pneumonia Hospitalization

Submission | Specifications

Description: The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

Numerator Statement: The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission date from the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

Denominator Statement: This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

Exclusions: The mortality measure excludes index admissions for patients in the following categories:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission
4. Discharged against medical advice (AMA)

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

Adjustment/Stratification: Statistical risk model with 36 risk factors

Level of Analysis: Facility

Setting of Care: Inpatient/Hospital

Type of Measure: Outcome

Data Source: Claims, Enrollment Data, Other

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING February 10, 2021

1. Importance to Measure and Report: The measure meets the Importance criteria.

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Total Votes-25**; **Pass-25**; **No Pass-0**; 1b. Performance Gap: **Total Votes-22; H-11**; **M-11**; **L-0**; **I-0**

Rationale:

- The Standing Committee considered the logic model submitted by the developer, which linked specific actions to this outcome.

- The Standing Committee noted that the developer provided updated evidence, which included additional studies that demonstrate the importance of pneumonia mortality as well as specific interventions that can be performed to reduce pneumonia mortality.
- The Standing Committee did not raise any questions or concerns related to the evidence and passed the measure unanimously on evidence.
- The Standing Committee considered the performance gap data, which showed three-year hospital-level, risk-standardized mortality rates with an average of 15.5% and a range from 7.4% to 27.9%. The median risk-standardized rate was 15.4%, and in 2019, the 20th percentile score was 14.0%, the median was 15.4%, and the 80th percentile was 17.2%.
- Regarding disparities, the Standing Committee discussed the impact of COVID-19 on disparities due to the high-risk of mortality with respiratory-related conditions, such as pneumonia. The Standing Committee acknowledged that COVID-19 was not part of the current submission, as the testing was conducted pre-COVID-19. The Standing Committee noted there will most likely be greater differences in disparities in 2020 and ultimately passed the measure on performance gap.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria.

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

Does the Standing Committee accept the Scientific Methods Panel's High rating for Reliability? **Total Votes-20; Yes-20; No-0**

Does the Standing Committee accept the Scientific Methods Panel's Moderate rating for Validity? **Total Votes-22; Yes-20; No-2**

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel.
- The NQF Scientific Methods Panel's ratings for Reliability: **H-4; M-4; L-0; I-0**
- The NQF Scientific Methods Panel's ratings for Validity: **H-1; M-5; L-1; I-1**

- The Standing Committee voted to accept the NQF Scientific Methods Panel's High rating for reliability and moderate rating of validity.

Rationale:

- The Standing Committee noted that this measure was reviewed by the Scientific Methods Panel (SMP), which passed the measure on both reliability and validity.

Reliability

- The Standing Committee considered the reliability testing, in which two types of reliability testing were conducted at the measure score-level: (1) the intra-class correlation coefficient (ICC) using a split sample (i.e., test-retest) method and (2) the facility-level reliability (signal-to-noise reliability).

- The ICCs were calculated for hospitals with 25 admissions or more. Using the Spearman-Brown prediction formula, the agreement between the two independent assessments of RSMR for each hospital was 0.668.
- The median signal-to-noise reliability score was 0.78, ranging from 0.31 to 0.98. The 25th and 75th percentiles were 0.59 and 0.88, respectively.
- The SMP reviewed this measure and passed the measure on reliability (H-4; M-4; L-0; I-0).
- The Standing Committee raised some concern with the lower case-volume facilities (<25th percentile) and the associated reliability scores. The developer commented that reliability is a function of sample size and, as a result, reliability scores increase as the sample size (i.e., case volume) increases. However, with an increase in the case-volume cutoff (i.e., >25 admissions), a tradeoff with transparency to the public occurs regarding how well those providers are performing. The Standing Committee further considered that case-volume cutoffs should be set based on a reliability threshold. The Standing Committee further acknowledged that this is dependent on CMS' use of the measure, that NQF Scientific Acceptability standards are agnostic to use, and that changes to volume cutoffs by CMS would not be done quickly.
- Ultimately, the Standing Committee voted to uphold the SMP's decision to pass the measure on reliability.

Validity

- The Standing Committee considered the validity testing, in which the developer conducted empirical validity testing at the measure score-level. Two measures were used for validity testing correlations: the Hospital Star-Rating Mortality group and the overall Hospital Star rating.
- The correlation between PN RSMRs and the Star-Rating mortality score is -0.653, which suggests that hospitals with lower PN RSMRs are more likely to have higher Star-Rating mortality scores.
- The correlation between PN RSMRs and the Star-Rating summary score is -0.306, which suggests that hospitals with lower PN RSMRs are more likely to have higher Star-Rating summary scores.
- The Standing Committee reviewed the risk adjustment model, noting that 36 risk factors were included in the model. The Standing Committee acknowledged that dual eligibility and the Agency for Healthcare Research and Quality's (AHRQ) Socioeconomic Status (SES) index were considered in testing but were not included in the final model.
- The SMP reviewed this measure and passed the measure on validity (H-1; M-5; L-1; I-1).
- The Standing Committee raised some concerns about the lack of inclusion of source of admission and social risk factor (SRF) adjustments. The Standing Committee expressed that this measure may under adjust and not account for where patients are admitted from. The developer clarified that source of admission was not utilized because historically, this field in claims was not audited. Regarding social risk factor adjustment, the Standing Committee considered the developer's rationale for not including these factors in the model. The developer mentioned that the impact of any of these SRF indicators is small to negligible on model performance and hospital-level results. Given these empirical findings, the Assistant Secretary

for Planning and Evaluation recommended not to risk adjust publicly reported quality measures for SRFs. CMS chose to not incorporate SRF variables in this measure.

- The Standing Committee ultimately upheld the SMP's decision to pass the measure on validity.

3. Feasibility: Total Votes-21; H-19; M-2; L-0; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee considered that this measure uses electronic claims data and did not raise any questions or concerns.
- The Standing Committee passed the measure on feasibility.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Total Votes-21; Pass-21; No Pass-0** *4b. Usability:* **Total Votes-20; H-9; M-10-; L-1; I- 0**

Rationale:

- The Standing Committee noted that this measure is currently used in the Hospital Value-Based Purchasing Program and Care Compare for accountability and public reporting.
- The Standing Committee considered how those entities that are being measured are provided with performance results, noting that each hospital receives their measure results in the spring of each calendar year through CMS' QualityNet website. The results are then publicly reported on CMS' Care Compare website in July of each calendar year.
- The Standing Committee voted to pass the measure on use.
- Regarding usability, the Committee considered that the median hospital 30-day, all-cause, RSRR for the pneumonia mortality measure for the three-year period between July 1, 2016, and June 30, 2019, was 15.4%. The median RSRR decreased by one absolute percentage point from July 2016-June 2017 (median RSRR: 15.9%) to July 2018-June 2019 (median: RSRR: 14.9%).
- The Standing Committee also considered the unintended consequences of the measure, noting that this measure may drive hospitals to turn away patients in order to avoid the index admission and not be held accountable for any mortality. The Standing Committee noted that this was based on studies that showed readmission rates declining while mortality rates were increasing. However, the other studies have shown no apparent increase. The Standing Committee acknowledged that an independent research group, commissioned by CMS to investigate this issue, found insufficient evidence to tie the implementation of this measure with rising mortality rates.
- After reviewing this information, the Standing Committee agreed that this measure meets NQF's standards for this criterion and passed the measure on usability.

5. Related and Competing Measures

- This measure is related to the following measures:
    - #0231 Pneumonia Mortality Rate (IQI #20)
    - #0279 Community-Acquired Pneumonia Admission Rate (PQI 11)

- #0506 Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
- #1891 Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization
- #1893 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization
- #2579 Hospital-Level, Risk-Standardized Payment Associated With a 30-Day Episode of Care for Pneumonia (PN)
- #3502 Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
- #3504 Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

- The Standing Committee reviewed the related measures and acknowledged that this measure has been appropriately harmonized. No related or competing measures were noted.

6. **Standing Committee Recommendation for Endorsement**: **Total Votes-21; Y-21**; **N-0**
7. **Public and Member Comment**

- NQF received two pre-evaluation comments and two post-evaluation comments.

Comments received expressed:

- Concern around whether the measure meets the scientific acceptability criteria due to the reliability threshold and intraclass correlation coefficients at the minimum sample size.
- Concern regarding the lack of inclusion of social risk factors in the risk adjustment model.

8. **Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X**
9. **Appeals**

#0531 Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite

Submission | Specifications

Description: The PSI 90 composite measure summarizes patient safety across multiple indicators for the CMS Medicare fee-for-service population.

Numerator Statement: PSI 03: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for pressure ulcer stage III or IV (or unstageable).

PSI 06: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for iatrogenic pneumothorax.

PSI 08: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for hip fracture.

PSI 09: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with: any secondary ICD-10-CM diagnosis codes for perioperative hemorrhage or hematoma and any-listed ICD-10-CM procedure codes for treatment of hemorrhage or hematoma (Note: The ICD-10-CM specification is limited to postoperative hemorrhage or hematoma).

PSI 10: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for acute renal failure and any-listed ICD-10-CM procedure codes for dialysis.

PSI 11: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with either: any secondary ICD-10-CM diagnosis code for acute respiratory failure; or any-listed ICD-10-CM procedure codes for a mechanical ventilation for 96 consecutive hours or more that occurs zero or more days after the first major operating room procedure code (based on days from admission to procedure); or any-listed ICD-10-CM procedure codes for a mechanical ventilation for less than 96 consecutive hours (or undetermined) that occurs two or more

days after the first major operating room procedure code (based on days from admission to procedure); or any-listed ICD-10-CM procedure codes for a reintubation that occurs one or more days after the first major operating room procedure code (based on days from admission to procedure).

PSI 12: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with a secondary ICD-10-CM diagnosis code for proximal deep vein thrombosis or a secondary ICD-10-CM diagnosis code for pulmonary embolism.

PSI 13: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for sepsis.

PSI 14: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any-listed ICD-10-PCS procedure codes for repair of the abdominal wall and any-listed ICD-10-CM diagnosis code for disruption of internal surgical wound

PSI 15: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for accidental puncture or laceration during a procedure and second abdominopelvic operation >=1 day after an index abdominopelvic operation.

Denominator Statement: PSI 03: Surgical or medical discharges, for patients ages 18 years and older. Surgical and medical discharges are defined by specific MS-DRG codes.

PSI 06: Surgical and medical discharges, for patients ages 18 years and older. Surgical and medical discharges are defined by specific MS-DRG codes.

PSI 08: Discharges, for patients ages 18 years and older, in a medical DRG or in a surgical DRG, with any listed ICD-10-PCS procedure codes for an operating room procedure.

PSI 09: Surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Surgical discharges are defined by specific MS-DRG codes.

PSI 10: Elective surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Elective surgical discharges are defined by specific MS-DRG codes with admission type recorded as elective.

PSI 11: Elective surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Elective surgical discharges are defined by specific MS-DRG codes with admission type recorded as elective.

PSI 12: Surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Surgical discharges are defined by specific MS-DRG codes.

PSI 13: Elective surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Elective surgical discharges are defined by specific MS-DRG codes with admission type recorded as elective.

PSI 14: Discharges, for patients ages 18 years and older, with any-listed ICD-10-CM procedure codes for abdominopelvic surgery, open approach, or with any-listed ICD-10-PCS procedure codes for abdominopelvic surgery, other than open approach.

PSI 15: Surgical and medical discharges, for patients ages 18 years and older, with any ICD-10-PCS procedure code for an abdominopelvic procedure

Exclusions: PSI 03:

- Length of stay of less than 3 days
- Principal ICD-10-CM diagnosis code for pressure ulcer stage III or IV (or unstageable)
- All secondary ICD-10-CM diagnosis codes for pressure ulcer III or IV (or unstageable) present on admission. If more than one diagnosis of pressure ulcer is present, all diagnoses must be present on admission for the discharge to be excluded.
- Any listed ICD-10-CM diagnosis code for severe burns (>20% body surface area)
- Any listed ICD-10-CM diagnosis code for exfoliative disorders of the skin (>20% body surface area)
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 06:

- Principal ICD-10-CM diagnosis code for iatrogenic pneumothorax
- Any secondary ICD-10-CM diagnosis code for iatrogenic pneumothorax present on admission, among patients qualifying for the numerator
- Any listed ICD-10-CM diagnosis codes for specified chest trauma (rib fractures, traumatic pneumothorax and related chest wall injuries)
- Any listed ICD-10-CM diagnosis codes for pleural effusion
- Any listed ICD-10-PCS procedure codes for thoracic surgery
- Any listed ICD-10-CM procedure codes for cardiac procedure;
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 08:

- Principal ICD-10-CM diagnosis code for hip fracture
- Any secondary ICD-10-CM diagnosis code for hip fracture present on admission, among patients otherwise qualifying for the numerator
- Principal ICD-10-CM diagnosis code for seizure
- Principal ICD-10-CM diagnosis code for syncope
- Principal ICD-10-CM diagnosis code for stroke and occlusion of arteries
- Principal ICD-10-CM diagnosis code for coma
- Principal ICD-10-CM diagnosis code for cardiac arrest
- Principal ICD-10-CM diagnosis code for poisoning
- Principal ICD-10-CM diagnosis code for trauma
- Principal ICD-10-CM diagnosis code for delirium and other psychoses
- Principal ICD-10-CM diagnosis code for anoxic brain injury
- Any listed ICD-10-CM diagnosis codes for metastatic cancer
- Any listed ICD-10-CM diagnosis codes for lymphoid malignancy
- Any listed ICD-10-CM diagnosis codes for bone malignancy
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 09:

- Principal ICD-10-CMS diagnosis code for perioperative hemorrhage or postoperative hematoma
- Any secondary ICD-10-CM diagnosis present on admission for perioperative hemorrhage or postoperative hematoma, among discharges that otherwise qualify for the numerator
- The only operating room procedure is for treatment of perioperative hemorrhage, or hematoma and with any secondary ICD-10-CM diagnosis codes for perioperative hemorrhage or hematoma
- Treatment of postoperative hemorrhage or hematoma occurs one day or more before the first operating room procedure, and with any secondary ICD-10-CM diagnosis codes for postoperative hemorrhage or hematoma
- With any listed ICD-10-CM diagnosis codes for coagulation disorders
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 10:

- Principal ICD-10-CM diagnosis code for acute renal failure, cardiac arrest, cardiac dysrhythmia, shock or chronic kidney failure

- Any secondary ICD-10-CM diagnosis code for acute kidney failure, cardiac arrest, cardiac dysrhythmia, shock or chronic kidney failure, present on admission, among patients otherwise qualifying for the numerator
- Any dialysis procedure that occurs before or on the same day as the first operating room procedure
- Any dialysis access procedure occurring before or on the same day as the first operating room procedure
- Principal ICD-10-CM (or secondary diagnosis present on admission) for urinary tract obstruction
- Any ICD-10-CM diagnosis code present on admission for solitary kidney disease and any ICD-10-PCS procedure code for partial nephrectomy
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 11:

- Principal ICD-10-CM diagnosis code for acute respiratory failure
- Any secondary ICD-10-CM diagnosis code for respiratory failure present on admission, among patients otherwise qualifying for the numerator
- Only operating room procedure is tracheostomy
- Procedure for tracheostomy occurs before the first operating room procedure
- Any listed ICD-10-CM diagnosis codes for neuromuscular disorder
- Any listed ICD-10-PCS procedure codes for laryngeal or pharyngeal, nose, mouth pharynx or facial surgery
- Any listed ICD-10-CM procedure codes for esophageal resection
- Any listed ICD-10-CM procedure codes for lung cancer
- Any listed ICD-10-CM diagnosis codes for degenerative neurological disorder
- Any listed ICD-10-CM procedure codes for lung transplant
- MDC 4 (diseases/disorders of respiratory system);
- MDC 5 (diseases/disorders of circulatory system);
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 12:

- Principal ICD-10-CM diagnosis code for proximal deep vein thrombosis (DVT) or pulmonary embolism (PE),
- Any secondary ICD-10-CM diagnosis code for DVT or PE present on admission, among patients otherwise qualifying for the numerator
- Procedure for interruption of vena cava occurs before or on the same day as the first operating room procedure
- Only operating room procedure was interruption of vena cava
- Any listed ICD-10-CM diagnosis code for acute brain or spinal injury present on admission
- Any listed ICD-10-PCS procedure code for extracorporeal membrane oxygenation (ECMO)
- Procedure for pulmonary arterial thrombectomy occurs before or on the same day as the first operating room procedure
- Only operating room procedure was for pulmonary arterial thrombectomy
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 13:

- Principal ICD-10-CM diagnosis code for sepsis or infection
- Any secondary ICD-10-CM diagnosis code for sepsis or infection present on admission, among patients otherwise qualifying for the numerator
- MDC 14 (pregnancy, childbirth, and puerperium)

- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 14:

- Procedure for abdominal wall reclosure occurs on or before the day of the first open abdominopelvic surgery procedure, if any, and the day of the first laparoscopic abdominopelvic surgery procedure, if any
- Any listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state
- Principal ICD-10-CM diagnosis code for disruption of internal operation wound
- Any secondary ICD-10-CM diagnosis code for disruption of internal operation wound present on admission
- Length of stay less than two (2) days-MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 15:

- Principal ICD-10-CM diagnosis code for accidental puncture or lacerations during a procedure
- Any secondary ICD-10-CM diagnosis code for accidental puncture or laceration during a procedure, among patients otherwise qualifying for the numerator
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

Adjustment/Stratification: Statistical risk model with 49 (PSI 14B) - 135 (PSI 03) risk factors

Level of Analysis: Facility

Setting of Care: Inpatient/Hospital

Type of Measure: Composite

Data Source: Claims

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING February 10, 2021

1. **Importance to Measure and Report: The measure meets the Importance criteria.**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Total Votes-21; Pass-21; No Pass-0;** 1b. Performance Gap: **Total Votes-23; H-12**; **M-11**; **L-0**; **I-0;** 1c. Composite Quality Construct: **Total Votes-22; H-11; M-11; L-0; I-0**

Rationale:

- The developer provided detailed literature reviews of the evidence for each of the component outcome measures for NQF #0531, with information showing that one or more healthcare actions can be performed to reduce the incidence of each measure.
- The developer submitted performance gap information that demonstrated variation in hospital performance on PSI 90 using Medicare Fee-for-Service claims from 2016-2019.
- The developer also presented data demonstrating a performance gap for each of the individual components of PSI-90.
- Regarding the quality construct of the composite measure, PSI 90 combines information from 10 common patient safety events that may occur in hospitalized patients. It was created to provide a simple and transparent single metric that can be used to better understand, communicate, and track patient safety in U.S. hospitals.
- The Standing Committee did not raise any major concerns or questions and passed the measure on evidence and performance gap.

2. **Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria.**

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity, 2c. Composite construction

Does the Standing Committee accept the NQF Scientific Methods Panel's Moderate rating for Reliability?

Total Votes-24; Yes –24; No- 0

Does the Standing Committee accept **the** NQF Scientific Methods Panel's Moderate rating **for** Validity?

Total Votes-24; Yes -23; No -1

Does the Standing Committee accept **the** NQF Scientific Methods Panel's Moderate rating **for** Composite Construction? **Total Votes-25**; **Yes- 25; No-0**

This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel.

- The NQF Scientific Methods Panel's ratings for Reliability: **H-2; M-5; L-0; I-1**
- The NQF Scientific Methods Panel's ratings for Validity: **H-2; M-4; L-1; I-1**
- The NQF Scientific Methods Panel's ratings for Composite Construction: **H-2; M-4; L-1; I-1**

• The Standing Committee voted to accept the NQF Scientific Methods Panel's moderate rating for reliability, validity, and composite construction.

Rationale:

- The Standing Committee considered the component-level reliability, which was reported using signal-to-noise ratios for each of PSI 90's components. Weighted mean scores ranged in CMS v10.0 from 0.152 for PSI 08 to 0.777 for PSI 03.
- Split-sample reliability testing was conducted to assess the composite, as well as test-retest reliability. The median ICC for 24 months of data was 0.74 and 0.81 for 36 months of data for split-sample reliability.
- For test-retest reliability, ICC was 0.60 for 24 months of data and 0.70 for 36 months of data.
- Validity testing was conducted at three levels: face, component, and composite-level, using convergent validity.
- For component validity, the PSI 90 components were correlated with a variety of other related outcomes, showing variable effects.
- For convergent validity, PSI 90 as a composite was correlated with several other measures of hospital quality, all showing positive associations.
- When compared to some measures of culture of safety, workforce measures, and nursing ratios, there was no consistent association between PSI 90 and these other measures.
- A Technical Expert Panel (TEP) voted 12-1 in favor of PSI 90 in July 2020.
- The Standing Committee considered the SMP's review, which passed the measure on reliability, validity, and the composite construction.
- The Standing Committee upheld the SMP's decision.

3. **Feasibility: Total Votes-23**; **H-18; M-5; L-0; I-0**

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- All data elements are in defined fields in electronic claims.
- The Standing Committee did not raise any major concerns and passed the measure on feasibility.

4. **Use and Usability**

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Total Votes-25**; **Pass-25; No Pass-0** *4b. Usability:* **Total Votes-24**; **H-19; M-5; L-0; I-0**

Rationale:

- The measure is currently publicly reported in a variety of programs and used in accountability programs.
- Several feedback mechanisms exist for PSI 90.
- From 2016-2018, PSI 90 showed minimal changes in national Medicare FFS data; however, the outlier values have decreased.
- Several national observed rates of PSI 90 component measures have improved from 2016 to 2019.
- The Standing Committee did not raise any major concerns and passed the measure on use and usability.

5. **Related and Competing Measures**

- No related or competing measures were noted.

6. **Standing Committee Recommendation for Endorsement**: **Total Votes-23**; **Y-23**; **N-0**

7. **Public and Member Comment**

- NQF received two pre-evaluation comments and three post-evaluation comments.

Comments received expressed:

- Concern around whether the measure meets the scientific acceptability criteria.
- Concerns around reliability threshold and intraclass correlation coefficients (ICC) at the minimum sample size.
- Concern regarding the lack of inclusion of social risk factors in the risk adjustment model.
- Concern with the measure of Post-Surgical Hip Fracture being used as the only representative measure of falls with injury.

8. **Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X**
9. **Appeals**

#1893 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization

Submission | **Specifications**

Description: The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS)

Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Numerator Statement: The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

Denominator Statement: This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

Exclusions: The mortality measures exclude index admissions for patients in the following categories:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission
3. Discharged against medical advice (AMA)

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

Adjustment/Stratification: Statistical risk model with 41 risk factors

Level of Analysis: Facility

Setting of Care: Inpatient/Hospital

Type of Measure: Outcome

Data Source: Claims, Enrollment Data, Other

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING February 10, 2021

1. **Importance to Measure and Report: The measure meets the Importance criteria.**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Total Votes-23**; **Pass-23; No Pass-0**; 1b. Performance Gap: **Total Votes-22**; **H-11; M-11; L-0; I-0**

Rationale:

- The Standing Committee reviewed and considered the logic model submitted by the developer, which linked specific actions to this outcome.

- The Standing Committee noted the developer provided literature that supported COPD as an important, common, high-cost, and complex condition.

- The Standing Committee voted unanimously to pass the measure on the evidence criterion based on the strength of the evidence in measuring differences in quality, along with literature reviews supporting the use of interventions in reducing COPD mortality.

- The Standing Committee considered performance gap data, which demonstrated that data from July 1, 2016, to June 30, 2019, with Medicare claims and VA administrative data (n= 716,323 admissions from 4,642 hospitals), the three-year hospital-level, risk-standardized mortality rates (RSMRs) had a mean of 8.4% and range from 5.1-13.6% in the study cohort. The median risk-standardized rate was 8.3%.
- The Standing Committee did not raise any major concerns and voted to pass the measure on performance gap.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

Does the Standing Committee accept the NQF Scientific Methods Panel's Moderate rating for Reliability?

Total Votes-22; **Yes – 22 No-0**

Does the Standing Committee accept the NQF Scientific Methods Panel's Moderate rating for Validity?

Total Votes-22; **Yes - 22 No -0**

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel.
- The NQF Scientific Methods Panel's ratings for Reliability: **H-0; M-6; L-1; I-0**
- The NQF Scientific Methods Panel's ratings for Validity: **H-2; M-5; L-0; I-0**
- The Standing Committee voted to accept the NQF Scientific Methods Panel's moderate rating for reliability and validity.

Rationale:

- The Standing Committee noted that this measure was reviewed by the Scientific Methods Panel (SMP), which passed the measure on both reliability and validity.

Reliability

- The Standing Committee considered the reliability testing, in which two types of reliability testing were conducted at the measure score-level: (1) the intra-class correlation coefficient (ICC) using a split sample (i.e., test-retest) method and (2) the facility-level reliability (signal-to-noise reliability).
- The median reliability was 0.72 with a range of 0.32 to 0.97 with the IQR of 0.54 (25^{th}) to 0.83 (75^{th}).
- The SMP reviewed this measure and passed the measure on reliability (H-0; M-6; L-1; I-0).
- The Standing Committee did not raise any major concerns with reliability and voted to uphold the SMP's decision to pass the measure on reliability.

Validity

- The Standing Committee considered the validity testing, in which the developer conducted empirical validity testing at the measure score-level. Two measures were used for validity testing correlations: the Hospital Star Rating Mortality group and the overall Hospital Star-Rating.

- The correlation between COPD RSMRs and the Star-Rating mortality score was -0.618, suggesting that hospitals with lower COPD RSMRs are more likely to have higher Star-Rating mortality scores.
- The correlation between COPD RSMRs and the Star-Rating summary score was -0.165, suggesting that hospitals with lower COPD RSMRs are more likely to have higher Star-Rating summary scores.
- The Standing Committee reviewed the risk adjustment model, noting that 41 risk factors were included in the model. The Standing Committee acknowledged that dual eligibility data obtained through enrollment data, the Agency for Healthcare Research and Quality's (AHRQ) Socioeconomic Status (SES) index, and Health Administration data were also included in the testing subset.
- The SMP reviewed this measure and passed the measure on validity (H-2; M-5; L-0; I-0).
- The Standing Committee did not raise any major concerns and voted to uphold the SMP's decision to pass the measure on validity.

3. **Feasibility: Total Votes-23**; **H-16; M-7; L-0; I-0**

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee considered that this measure uses electronic claims data and did not raise any questions or concerns.
- The Standing Committee passed the measure on feasibility.

4. **Use and Usability**

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Total Votes-2**4; **Pass-24; No Pass-0** 4b. Usability: **Total Votes-22**; **H-8; M-13; L-1; I-0**

Rationale:

- The Standing Committee noted that this measure is currently used in the Hospital Value-Based Purchasing Program and Care Compare for accountability and public reporting.

- The Standing Committee considered how those entities that are being measured are provided with performance results, noting that each hospital receives their measure results in the spring of each calendar year through CMS' QualityNet website. The results are then publicly reported on CMS' Care Compare website in July of each calendar year.

- The Standing Committee voted to pass the measure on use.

- The Committee considered that progress toward achieving the goal of high quality, efficient healthcare for individuals or populations is demonstrated as evidenced by the median hospital 30-day, all-cause, RSMR for the COPD mortality measure for the three-year period between July

1, 2016, and June 30, 2019, was 8.3%. The median RSMR decreased by 0.7 absolute percentage points from July 2016-June 2017 (median RSMR: 8.6%) to July 2018-June 2019 (median: RSRR: 7.9%).

- The Standing Committee considered that this measure may have unintended consequences as the mortality rate for COPD has increased, lending concern to patients being denied care. The Standing Committee acknowledged that such claims are unfounded, also noting that because it is publicly reported and currently in use, no adverse unintended consequences have been demonstrated.
- After reviewing this information, the Standing Committee agreed that this measure meets NQF's standards for this criterion and passed the measure on usability.

5. Related and Competing Measures

- This measure is related to the following measures:
    - #0231 Pneumonia Mortality Rate (IQI #20)
    - #0279 Community-Acquired Pneumonia Admission Rate (PQI 11)
    - #0468 Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Pneumonia Hospitalization
    - #0506 Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
    - #1891 Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization
    - #2579 Hospital-Level, Risk-Standardized Payment Associated With a 30-Day Episode of Care for Pneumonia (PN)
    - #3502 Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
    - #3504 Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
- The Standing Committee reviewed the related measures and acknowledged that this measure has been appropriately harmonized.

6. Standing Committee Recommendation for Endorsement: **Total Votes-22**; **Y-22**; **N-0**

7. Public and Member Comment

- NQF received two pre-evaluation comments and two post-evaluation comments.

Comments received expressed:

- Concern around whether the measure meets the scientific acceptability criteria due to the reliability threshold and intraclass correlation coefficients at the minimum sample size.
- Concern regarding the lack of inclusion of social risk factors in the risk adjustment model.

8. Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X

9. Appeals

#2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Submission | Specifications

Description: The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure:

-Rate 1: The percentage of those with a history of falls that received a potentially harmful medication

-Rate 2: The percentage of those with dementia that received a potentially harmful medication

-Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication

A lower rate represents better performance for all rates.

Numerator Statement: Numerator 1: Patients with a history of falls who received at least one potentially harmful medication from Table DDE-A or Table DDE-B

Numerator 2: Patients with a diagnosis of dementia who received at least one potentially harmful medication from Table DDE-D

Numerator 3: Patients with chronic kidney disease who received at least one potentially harmful medication from Table DDE-E

Denominator Statement: All patients 65 years of age and older with a history of falls, dementia or chronic kidney disease in the measurement year or the year prior to the measurement year.

Exclusions: For those who meet denominator criteria for the history of falls rate (Rate 1): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder or seizure disorder.

For those who meet denominator criteria for the dementia rate (Rate 2): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder or bipolar disorder.

Adjustment/Stratification: No risk adjustment or risk stratification

Level of Analysis: Health Plan

Setting of Care: Outpatient Services

Type of Measure: Process

Data Source: Claims

Measure Steward: National Committee for Quality Assurance

STANDING COMMITTEE MEETING February 10, 2021

1. **Importance to Measure and Report: The measure meets the Importance criteria.**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Total Votes-2**1; **H-6; M-14; L-1; I-0**; 1b. Performance Gap: **Total Votes-2**0; **H-7; M-13; L-0; I-0**

Rationale:

- The Standing Committee considered updated evidence for this measure, including changes to the 2019 Beers Criteria, guiding principles on which conditions would be included in the measure, and the American Geriatrics Society 2019 Beers Criteria Update Expert Panel.
- No questions or concerns were raised by the Standing Committee, which passed the measure on evidence.
- The Standing Committee considered data extracted from the HEDIS data collection for Medicare Advantage Health Plans (including both HMO and PPO plans), which indicated opportunity for improvement.
- Regarding disparities, the Standing Committee considered HEDIS data stratified by type of insurance and the fact that the measure can also be stratified by demographic variables, such as

race/ethnicity or socioeconomic status, in order to assess the presence of health care disparities if the data are available to a plan. The Standing Committee considered that while disparities for this measure have not been well studied, there is some evidence to suggest differences in the use of potentially inappropriate medications by gender, race, and income status, reviewing two such studies cited by the developer.

- The Standing Committee ultimately passed the measure on performance gap.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria.

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

2a. Reliability: **Total Votes-21**; **H-4; M-17; L-0; I-0**; 2b. Validity: **Total Votes-19**; **H-5; M-14; L-0; I-0**

Rationale:

Reliability

- The Standing Committee considered reliability testing performed at the performance measure score level on three measure rates for specific underlying conditions in which a potentially harmful medication was prescribed: (1) A history of falls and a prescription for anticonvulsants, antipsychotics, benzodiazepines, non-benzodiazepine hypnotics, or antidepressants, (2) dementia and a prescription for antipsychotics, benzodiazepines, non-benzodiazepine hypnotics, tricyclic antidepressants, or anticholinergic agents, and (3) chronic kidney disease and prescription for Cox-2 selective NSAIDs or non-aspirin NSAIDs.
- Signal-to-noise testing was conducted, as well as Standard Error and 95% Confidence Interval.
- The Standing Committee considered that while all three measure rates appear reliable, there is lower reliability in some health plans that fall well below the 0.7 threshold.
- No questions or concerns were raised by the Standing Committee.
- The Standing Committee passed the measure on reliability.

Validity

- The Standing Committee considered validity testing performed at the performance measure score level.
- Empirical validity testing was performed for construct validity as compared to a similar measure, NQF #0022 *Use of High-Risk Medications in Older Adults*, which assesses the percentage of Medicare members ages 65 years and older who had at least two dispensing events for the same high-risk medication and a correlation between the three different patient populations. Correlations between the DDE measure for the three rates were all positive and varied from 0.24 to 0.63.
- Face validity was performed through advisory panels, NCQA staff, and public review.
- Empirical validity testing suggested that there was a significant correlation in the direction expected with a similar measure of medication safety in health plans in addition to positive

correlations found among the three measured populations. For face validity, the developer ensured that the measure was aligned with the 2019 Beers criteria.

- The Standing Committee did not raise any major questions or concerns and passed the measure on validity.

3. Feasibility: Total Votes-21; **H-13; M-8; L-0; I-0**

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee considered that the data elements are generated or collected by and used by healthcare personnel during the provision of care and are in defined fields in a combination of electronic sources.
- The Standing Committee did not raise any questions or concerns and passed the measure on feasibility.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Total Votes-19**; **Pass-19; No Pass-0** *4b. Usability:* **Total Votes-20**; **H-4; M-13; L-3; I-0**

Rationale:

- The Standing Committee noted that this measure is currently used in scoring for accreditation of Medicare Advantage Health Plans and NCQA's ACO Accreditation program. It is also used to calculate health plan ratings, which are reported on the NCQA website, and is publicly reported nationally and by geographic regions in the NCQA State of Health Care annual report.
- The Standing Committee considered that the developer publicly reports rates across all plans and creates benchmarks in order to help plans understand how they perform relative to other plans. The Standing Committee also considered that health plans that report HEDIS calculate their rates and know their performance when submitting to NCQA, with no reported barriers to implementation.
- Regarding usability, the Standing Committee considered data for all three rates of the measure for 2018, noting significant room for improvement in medication safety for older adults, particularly for the history of falls and dementia rates. The Standing Committee also considered that among all rates, there is a sizeable gap between the plans at the 10th and 90th percentiles, demonstrating a persistent gap in care between the best and worst performing health plans.
- Related to potential harm, the Standing Committee considered the potential for reduced access to medications should the measure be implemented poorly, in addition to individual cases that warrant the use of a potentially harmful medication based on the relative risk/benefit.
- The Standing Committee inquired whether there was a threshold to consider when reviewing improvement over time, to which NQF staff informed them that although there is no threshold, it is dependent on the context of use for the measure, namely when and how it is used, how long it is used, and any updates to the measure.
- The Standing Committee passed the measure on use and usability.

5. Related and Competing Measures

- This measure is related to NQF #0022 *Use of High-Risk Medications in Older Adults (DAE)*.
- The Standing Committee reviewed and acknowledged that this measure has been appropriately harmonized. No competing measures were noted.

6. **Standing Committee Recommendation for Endorsement**: **Total Votes-20**; **Y-20**; **N-0**

7. **Public and Member Comment**
   - NQF received one supportive post-evaluation comment noting that drug-disease interactions in the setting of a history of falls, dementia, and chronic kidney disease warrant performance measurement and continued prioritization in outpatient settings.
8. **Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X**
9. **Appeals**

Measures Where Consensus Was Not Reached

#0097 Medication Reconciliation Post-Discharge

Submission | Specifications

Description: The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

Numerator Statement: Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

Denominator Statement: All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

Exclusions: No exclusions

Adjustment/Stratification: No risk adjustment or risk stratification

Level of Analysis: Health Plan

Setting of Care: Outpatient Services

Type of Measure: Process

Data Source: Claims, Electronic Health Records, Paper Medical Records

Measure Steward: National Committee for Quality Assurance

STANDING COMMITTEE MEETING February 10, 2021

1. **Importance to Measure and Report: The measure meets the Importance criteria.**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Total Votes-23**; **H-0; M-8; L-4; I-11**; 1b. Performance Gap: **Total Votes-23**; **H-9; M-11; L-2; I-1**

Post-Comment Revote: 1a. Evidence: **Total Votes-17; H-0; M-11; L-3; I-3**

Rationale:

- The Standing Committee reviewed the evidence supporting medication reconciliation and concluded that there was not a clear link to patient outcomes to justify measurement.

- A 2018 Cochrane systematic review did not find clear evidence that linked medication reconciliation to a variety of patient outcomes.
- However, the Standing Committee considered several studies that the developer provided that have suggested a decrease in medication errors when medication reconciliation, and other transition interventions, are implemented (Bayoumi 2009, Coleman 2003, Geurts 2012, Gillespie 2009, Midlov 2012, Nassaralla 2007).
- During the February 10, 2021 measure evaluation meeting, the NQF staff clarified quorum voting thresholds that are needed to pass the measure on evidence, which is based on the number of Standing Committee members present on the call and eligible to vote. NQF staff noted on the call that the Standing Committee did not reach consensus on evidence, which caused the Standing Committee to proceed with reviewing the measure against the remaining NQF criteria. However, after the call ended, it was identified that the measure did not pass on evidence. NQF staff and Standing Committee Co-Chairs suggested that due to the lack of clarity on the voting thresholds during the call, the evidence criterion will proceed with a revote during the post-comment meeting on June 4, 2021.
- The developer noted the high prevalence of adverse drug events and that about half of all adverse drug events are considered preventable. The developer also noted that on average, 82% of adults in the U.S. take at least one medication and 62% have multiple chronic conditions.
- The developer provided data demonstrating a performance gap from 2016 to 2018 HEDIS data with mean rates of 47%, 53%, and 61% in those years, respectively, with variation across health plans.
- During the post-comment discussions, quorum was achieved with 17 members of the Standing Committee present for the vote. The Standing Committee reviewed and discussed the comments received during the public commenting period, which were all supportive in continuing measurement of medication reconciliation, particularly until more robust measures of medication-related outcomes could be developed. Additionally, there was a comment that noted the success of medication reconciliation in reducing medication discrepancies at discharge. Finally, there was a supportive comment about medication reconciliation to ensure patient safety and continuity of care post-discharge. During the Standing Committee discussion, there were expressions of support for the measure, describing the importance of medication review from a recent JAMA article. Some Standing Committee members commented that lack of medication reconciliation is a significant risk factor for readmission to the hospital in a large rehabilitation setting. One Standing Committee member shared that medication reconciliation is performed daily by pharmacists, and did in his personal experience, result in catching medication errors. Based on this discussion and review of public comments, the Standing Committee revoted and passed the measure on evidence.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria.

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

2a. Reliability: **Total Votes-21**; **H-14; M-6; L-1; I-0**; 2b. Validity: **Total Votes-23**; **H-0; M-13; L-8; I-2 – Consensus Not Reached**

Rationale:

- The Standing Committee considered the signal-to-noise reliability testing, which was conducted across 472 Medicare plans with scores ranging from 0.977 to 1.00.
- The Standing Committee did not raise any major questions or concerns and passed the measure on reliability.
- The Standing Committee reviewed the validity testing submitted by the developer.
- Construct validity testing was performed comparing medication reconciliation post-discharge to three other HEDIS measures. The correlations were all positive and ranged from 0.43 for receipt of discharge information to 0.60 for patient engagement after inpatient discharge.
- Standing Committee members raised concern that this measure is an example of a "checkbox" measure that is easy to achieve in the EHR without a clear linkage to care management or outcomes.
- The developer reported that their measure advisory panels agreed with the measure's intent and proposed specification. The majority of public comments received supported the measure, and their CPM, and subsequently our Board of Directors, approved the measure for HEDIS reporting.
- There was an error in the validity vote (a must-pass criterion) occurring during the measure evaluation meeting for NQF #0097, in which the measure was stated as "passing on validity", when in fact, the vote score is Consensus Not Reached. The vote tally is as follows: Total Votes-23; High-0; Moderate-13; Low-8; Insufficient-2 (57% passing votes). In normal operations, the Standing Committee would have re-voted on this criterion during the post-comment meeting and, at that time, if consensus was not reached it would not have been recommended for endorsement. However, the error was discovered after the post-comment meeting, and it was not possible to re-convene the Standing Committee again. Therefore, NQF is allowing the measure to retain endorsement, and the Standing Committee revote on validity and the overall suitability for endorsement during the Fall 2021 cycle..

3. **Feasibility: Total Votes-22**; **H-11; M-10; L-1; I-0**

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- Some data elements are in defined fields in electronic sources. Health plans and providers that use an EHR to capture medication reconciliation use that data to report on this measure.
- The Standing Committee did not raise any major questions or concerns and passed the measure on feasibility.

4. **Use and Usability**

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Total Votes-2**1; **Pass-20; No Pass-1** *4b. Usability:* **Total Votes-23**; **H-8; M-14; L-1; I-0**

Rationale:

- The Standing Committee acknowledged that this measure is both publicly reported and used in accountability programs.
- The 2016-2018 data show that although performance rates for this measure are low, they have increased. In 2018, the average performance was 61.3.
- The Standing Committee did not raise any major questions or concerns and passed the measure on use and usability.

5. Related and Competing Measures

- The measure is related to the following measures:
  - #0419 Documentation of Current Medications in the Medical Record
  - #0553 Care for Older Adults (COA) – Medication Review
  - #2456 Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication per Patient
  - #2988 Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
  - #3317 Medication Reconciliation on Admission

6. Standing Committee Recommendation for Endorsement: **Total Votes-17; Y-16; N-1** *

Rationale

- During the February 10, 2021 measure evaluation meeting, NQF staff clarified quorum voting thresholds that are needed to pass the measure on evidence, which is based on the number of Standing Committee members present on the call and eligible to vote. NQF staff noted on the call that the Standing Committee did not reach consensus on evidence, which caused the Standing Committee to proceed with reviewing the measure against the remaining NQF criteria. However, after the call ended, it was identified that the measure did not pass on evidence. NQF staff and Standing Committee Co-Chairs suggested that due to the lack of clarity on the voting thresholds during the call, the evidence criterion will proceed with a revote during the post-comment meeting on June 4, 2021.
- During the post-comment meeting, the Standing Committee reviewed and discussed the comments received and passed the measure on evidence and the overall suitability for endorsement.

- *However, there was an error in the validity vote (a must-pass criterion) that occurred during the measure evaluation meeting for NQF #0097, in which the measure was stated as "passing on validity", when in fact, the vote score is Consensus Not Reached. The vote tally is as follows: Total Votes-23; High-0; Moderate-13; Low-8; Insufficient-2 (57% passing votes). In normal operations, the Standing Committee would have re-voted on this criterion during the post-comment meeting and, at that time, if consensus was not reached it would not have been recommended for endorsement. However, the error was discovered after the post-comment meeting, and it was not possible to re-convene the Standing Committee again. Therefore, NQF is allowing the measure to retain endorsement, and the Standing Committee revote on validity and the overall suitability for endorsement during the Fall 2021 cycle.

7. **Public and Member Comment**
   - NQF received four supportive post-evaluation comments on measure 0097.

   The comments expressed:
   - Support of the measure because it addresses a performance gap and mitigates potential patient harm when an outcome measure is not yet available or does not have a robust body of knowledge to merit a high ranking for scientific availability.
   - Support because of the success of medication reconciliation in decreasing medication discrepancies at discharge.
   - Support of the measure to ensure patient safety and continuity of care post-discharge.
8. **Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X**
9. **Appeals**

Appendix B: Patient Safety Portfolio—Use in Federal Programs[1]

NQF#	Title	Federal Programs: Finalized or Implemented
0022	Use of High-Risk Medications in the Elderly (DAE)	Merit-Based Incentive Payment System (MIPS) Program (Implemented)
0097	Medication Reconciliation Post-Discharge	Medicare Part C Star Rating (Implemented)
0101	Falls: Screening, Risk-Assessment, and Plan of Care to Prevent Future Falls	Medicare Shared Savings Program (MSSP) (Implemented) MIPS Program (Implemented)
0138	National Healthcare Safety Network (NHSN) Catheter-Associated Urinary Tract Infection (CAUTI) Outcome Measure	Hospital-Acquired Condition Reduction Program (HACRP) (Implemented) Inpatient Rehabilitation Facility (IRF) Quality Reporting (Implemented) Long-Term Care Hospital (LTCH) Quality Reporting (Implemented) Prospective Payment System (PPS)-Exempt Cancer Hospital Quality Reporting (Implemented)
0139	National Healthcare Safety Network (NHSN) Central Line-Associated Bloodstream Infection (CLABSI) Outcome Measure	HACRP (Implemented) LTCH Quality Reporting (Implemented) Long-Term Care Hospital (LTCH) Compare (Implemented) PPS-Exempt Cancer Hospital Quality Reporting (Implemented)
0419	Documentation of Current Medications in the Medical Record	MIPS Program (Implemented)
0419e	Documentation of Current Medications in the Medical Record	MIPS Program (Implemented) Medicaid Promoting Interoperability Program for Eligible Professionals (Implemented)
0468	Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Pneumonia Hospitalization	Hospital Value-Based Purchasing (Implemented)
0531	Patient Safety and Adverse Events Composite	HACRP (Implemented)
0553	Care for Older Adults (COA) – Medication Review	Medicare Part C Star Rating (Implemented)

[1] Per CMS Measures Inventory Tool as of 01/22/2021

NQF#	Title	Federal Programs: Finalized or Implemented
0555	INR Monitoring for Individuals on Warfarin	Marketplace Quality Rating System (Implemented)
0674	Percent of Residents Experiencing One or More Falls With Major Injury (Long Stay)	Home Health Quality Reporting (Implemented) LTCH Quality Reporting (Implemented) Skilled Nursing Facility Quality Reporting (Implemented) IRF Quality Reporting (Implemented)
0753	American College of Surgeons – Centers for Disease Control and Prevention (ACS-CDC) Harmonized Procedure Specific Surgical Site Infection (SSI) Outcome Measure	Hospital Value-Based Purchasing (VBP) (Implemented) Hospital Acquired Condition Reduction Program (Implemented) PPS-Exempt Cancer Hospital Quality Reporting (Implemented)
1716	National Healthcare Safety Network (NHSN) Facility-Wide Inpatient Hospital-Onset Methicillin-Resistant Staphylococcus Aureus (MRSA) Bacteremia Outcome Measure	HACRP (Implemented) PPS-Exempt Cancer Hospital Quality Reporting (Implemented)
1717	National Healthcare Safety Network (NHSN) Facility-Wide Inpatient Hospital-Onset Clostridium Difficile Infection (CDI) Outcome Measure	HACRP (Implemented) IRF Quality Reporting (Implemented) LTCH Quality Reporting (Implemented) PPS-Exempt Cancer Hospital Quality Reporting (Implemented)
1893	Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization	Hospital (VBP) (Implemented)
2726	Prevention of Central Venous Catheter (CVC)-Related Bloodstream Infections	MIPS Program (Implemented)
2940	Use of Opioids at High Dosage in Persons Without Cancer	Medicaid (Implemented)
2988	Medication Reconciliation for Patients Receiving Care at Dialysis Facilities	End-Stage Renal Disease Quality Incentive Program (Finalized)

Appendix C: Patient Safety Standing Committee and NQF Staff

STANDING COMMITTEE

Ed Septimus, MD (Co-Chair)
Professor of Internal Medicine, Texas A&M Health Science Center College of Medicine, Houston, Texas, and Senior Lecturer Department of Population Medicine, Harvard Medical School
Boston, MA

Iona Thraen, PhD, ACSW (Co-Chair)
Patient Safety Director, Utah Hospital and Health Clinics Adjunct Assistant Professor, University of Utah, School of Medicine, Department of Biomedical Informatics
Salt Lake City, UT

Emily Aaronson, MD
Assistant Chief Quality Officer, Massachusetts General Hospital
Boston, MA

Joel Bundy, MD, FACP, FASN, CPE
Vice President, Chief Quality & Safety Officer, Sentara Healthcare
Norfolk, VA

Elissa Charbonneau, DO, MS
Chief Medical Officer, Encompass Health Corporation
Birmingham, AL

Curtis Collins, PharmD, MS
Specialty Pharmacist, Infectious Diseases, St. Joseph Mercy Health System
Ann Arbor, MI

Theresa Edelstein, MPH, LNHA
Vice President, New Jersey Hospital Association
Princeton, NJ

Terry Fairbanks, MD, MS, FACEP
Vice President, Quality & Safety, MedStar Health
Washington, DC

Jason Falvey, DPT, PhD
Assistant Professor, University of Maryland School of Medicine, Department of Epidemiology and Public Health
Baltimore, MD

Robert Green, MD, MPH, MA
Vice President of Quality & Patient Safety, New York Presbyterian Healthcare System
New York, NY

Sara Hawkins PhD, RN, CPPS
Director of Patient Safety & Risk, Eastern Idaho Regional Medical Center (EIRMC)
Idaho Falls, ID

Bret Jackson
President, The Economic Alliance for Michigan
Novi, MI

John James, PhD
Founder, Patient Safety America
Houston, TX

Laura Kinney MA, BSN, RN, CPHQ, CPHRM, CPMA, CPC
Clinical Strategy Lead, Enterprise Clinical Quality, Office of the Chief Medical Officer, Humana Inc.
Louisville, KY

Arpana Mathur, MD, MBA
Medical Director, Physician Services, CVS Health
Naperville, IL

Raquel Mayne, MS, MPH, RN
Senior Quality Management Specialist, Hospital for Special Surgery
New York City, NY

Anne Myrka, RPh, MAT
Director, Drug Safety, Island Peer Review Organization (IPRO)
Lake Success, NY

Edward Pollak, MD
Chief Quality Officer, Henry Ford Health System
Detroit, MI

Jamie Roney, DNP, NPD-BC, CCRN-K
Covenant Health Texas Regional Research Coordinator, Covenant Health System
Lubbock, TX

Nancy Schoenborn, MD
Geriatric Medicine Specialist, American Geriatrics Society
Baltimore, MD

David Seidenwurm, MD, FACR
Quality and Safety Director, Sutter Health
Sacramento, CA

Geeta Sood, MD, ScM
The Society for Healthcare Epidemiology of America (SHEA)
Baltimore, MD

David Stockwell, MD, MBA
Associate Professor of Anesthesiology and Critical Care Medicine, Johns Hopkins University, SOM, Chief Medical Officer, Pascal Metrics, a Patient Safety Organization
Charlotte, NC

Donald Yealy, MD, FACEP
Professor and Chair, University of Pittsburgh-Department of Emergency Medicine
Pittsburgh, PA

Yanling Yu, PhD
Physical Oceanographer and Patient Safety Advocate, Washington Advocate for Patient Safety
Seattle, WA

NQF STAFF
Sheri Winsper, RN, MSN, MSHA
Senior Vice President

Michael Katherine Haynie
Senior Managing Director

Sai Ma, MPA, PhD
Managing Director/Senior Technical Expert

Matthew Pickering, PharmD
Senior Director

Terra C. Greene, MSN, RN
Director

Yemsrach Kidane, PMP
Project Manager

Chris Dawson, MHA, CPHQ, CPPS
Manager

Isaac Sakyi, MSGH
Senior Analyst

Jesse Pines, MD, MBA, MSCE
Consultant

Appendix D: Measure Specifications

0022 Use of High-Risk Medications in Older Adults (DAE)

STEWARD

National Committee for Quality Assurance

DESCRIPTION

The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance.

TYPE

Process

DATA SOURCE

Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.

LEVEL

Health Plan

SETTING

Outpatient Services

NUMERATOR STATEMENT

Patients who received at least two dispensing events for the same high-risk medication during the measurement year.

NUMERATOR DETAILS

Patients who had at least two dispensing events for the same high-risk medication during the measurement year.

Follow the steps below to identify numerator compliance. Include patients who meet criteria in more than one step only once in the numerator. Do not include denied claims.

Step 1: Identify patients with two or more dispensing events (any days supply) on different dates of service during the measurement year for a medication in Table DAE-A. The dispensing events must be for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant.

Step 2: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-B. Identify patients with two or more dispensing events on different dates of service for medications in the same medication class (as defined by the AGS Beers Criteria Table 2 and class title below). For example, a prescription for zolpidem and a prescription for zaleplon are considered two dispensing events for medications in the same medication class (these drugs share the same class title or description: Nonbenzodiazepine

hypnotics). Sum the days supply for prescriptions in the same medication class. Identify patients with two or more dispensing events for medications of the same medication class where the summed days supply exceeds the days supply criteria listed for the medication. These patients are numerator compliant. For medications dispensed during the measurement year sum the days supply and include any days supply that extends beyond December 31 of the measurement year. For example, a prescription of a 90-days supply dispensed on December 1 of the measurement year counts as a 90-days supply.

- Note: The intent is to identify all patients who had multiple dispensing events where the summed days supply exceeds the days supply criteria; there is no requirement that each dispensing event exceed the days supply criteria.

Step 3: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-C where average daily dose exceeds the average daily dose criteria listed for the medication. Identify patients with two or more dispensing events on different dates of service that exceed the average daily dose criteria for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. To calculate average daily dose for each dispensing event, multiply the quantity of pills dispensed by the dose of each pill and divide by the days supply. For example, a prescription for a 30-days supply of digoxin containing 15 pills, .250 mg each pill, has an average daily dose of 0.125 mg. To calculate average daily dose for elixirs and concentrates, multiply the volume dispensed by daily dose and divide by the days supply. Do not round when calculating average daily dose.

HIGH-RISK MEDICATIONS (Table DAE-A)

Anticholinergics, First-generation antihistamines---

Brompheniramine, Carbinoxamine, Chlorpheniramine, Clemastine, Cyproheptadine, Dexbrompheniramine, Dexchlorpheniramine, Diphenhydramine (oral), Dimenhydrinate, Doxylamine, Hydroxyzine, Meclizine, Promethazine, Pyrilamine, Triprolidine

Anticholinergics, anti-Parkinson agents---

Benztropine (oral), Trihexyphenidyl

Antispasmodics---

Atropine (exclude ophthalmic), Bellandonna alkaloids, Clidinium-Chlordiazepoxide, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine

Antithrombotics---

Dipyridamole, oral short-acting (does not apply to the extended-release combination with aspirin)

Cardiovascular, alpha agonists, central---

Guanabenz, Guanfacine, Methyldopa

Cardiovascular, other---

Disopyramide, Nifedipine (immediate release)

Central nervous system, antidepressants---

Amitriptyline, Clomipramine, Imipramine, Trimipramine, Amoxapine, Desipramine, Nortiptyline, Paroxetine, Protriptyline

Central nervous system, barbiturates---

Amobarbital, Butabarbital, Butalbital, Mephobarbital, Pentobarbital, Phenobarbital, Secobarbital

Central nervous system, vasodilators---

Ergot mesylates, Isoxsuprine

Central nervous system, other---

Meprobamate

Endocrine system, estrogens with or without progestins; include only oral and topical patch products---

Conjugated estrogen, Esterified estrogen, Estradiol, Estropipate

Endocrine system, sulfonylureas, long-duration---

Chlorpropamide, Glimepiride, Glyburide

Endocrine system, other---

Desiccated thyroid, Megestrol

Pain medications, skeletal muscle relaxants---

Carisoprodol, Chlorzoxazone, Cyclobenzaprine, Metaxalone, Methocarbamol, Orphenadrine

Pain medications, other---

Indomethacin, Ketorolac (includes parenteral), Meperidine

HIGH-RISK MEDICATIONS WITH DAYS SUPPLY CRITERIA (Table DAE-B)

Anti-infectives, other (greater than 90 days supply, days supply criteria)---

Nitrofurantoin, Nitrofurantoin macrocrystals, Nitrofurantoin macrocrystals-monohydrate

Nonbenzodiazepine hypnotics (greater than 90 days supply, days supply criteria)---

Eszopiclone, Zolpidem, Zaleplon

HIGH-RISK MEDICATIONS WITH AVERAGE DAILY DOSE CRITERIA (Table DAE-C)

Alpha agonists, central (greater than 0.1 mg/day, average daily dose criteria)---

Reserpine

Cardiovascular, other (greater than 0.125 mg/day, average daily dose criteria)---

Digoxin

Tertiary TCAs (as single agent or as part of combination products), (greater than 6 mg/day, average daily dose criteria)---

Doxepin

Note: NCQA will post a comprehensive list of medications and NDC codes to www.ncqa.org by November 2020. For medications in Table DAE-A and DAE-C, identify different drugs using the Drug ID field located in the NDC list on NCQA's Web site (www.ncqa.org), posted by November 2020.

DENOMINATOR STATEMENT

All patients 65 years of age and older.

DENOMINATOR DETAILS

All patients that are 66 years of age and older as of December 31 of the measurement year.

EXCLUSIONS

Patients who were enrolled in hospice care at any time during the measurement year.

EXCLUSION DETAILS

N/A

RISK ADJUSTMENT

No risk adjustment or risk stratification

STRATIFICATION

N/A

TYPE SCORE

Rate/proportion better quality = lower score

ALGORITHM

Step 1. Determine the denominator: All patients 66 years of age and older as of the end (i.e., December 31) of the measurement year.

Step 2: Identify the numerator: Individuals in the denominator who have dispensed at least two prescriptions for the same high-risk medication (see definition of high-risk medication in section S.6) during the measurement year.

Step 3: Divide Step 2 (numerator) by Step 1 (denominator) to calculate the rate.

Note: For this measure, a lower rate indicates better performance. 123834| 140881| 150289

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0097 Medication Reconciliation Post-Discharge

STEWARD

National Committee for Quality Assurance

DESCRIPTION

The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

TYPE

Process

DATA SOURCE

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing

care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system.

LEVEL

Health Plan

SETTING

Outpatient Services

NUMERATOR STATEMENT

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

NUMERATOR DETAILS

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

This measure is specified for medical record or administrative data collection.

Medical Record Reporting Details:

Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.
- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the patient's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Administrative Reporting Method Details:

See value sets provided for administrative codes meeting measure numerator intent.

DENOMINATOR STATEMENT

All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

DENOMINATOR DETAILS

To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

To identify nonacute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

Additional guidance for identifying appropriate discharges for inclusion in the eligible population:

- If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.

Additional guidance for identifying the eligible population:

Patients in hospice are removed from the eligible population.

EXCLUSIONS

No exclusions.

EXCLUSION DETAILS

N/A

RISK ADJUSTMENT

No risk adjustment or risk stratification

STRATIFICATION

N/A

TYPE SCORE

Rate/proportion better quality = higher score

ALGORITHM

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2. 123834| 140881| 150289

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0468 Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

STEWARD

Centers for Medicare & Medicaid Services

DESCRIPTION

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

TYPE

Outcome

DATA SOURCE

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

LEVEL

Facility

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

NUMERATOR DETAILS

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

DENOMINATOR STATEMENT

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

DENOMINATOR DETAILS

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

EXCLUSIONS

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

EXCLUSION DETAILS

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

N/A

TYPE SCORE

Rate/proportion better quality = lower score

ALGORITHM

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226. 107491| 118210| 112469| 146637| 150289

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0531 Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite

STEWARD

Centers for Medicare & Medicaid Services

DESCRIPTION

The PSI 90 composite measure summarizes patient safety across multiple indicators for the CMS Medicare fee-for-service population.

TYPE

Composite

DATA SOURCE

Claims While the measure is tested and specified using fee-for-service data from the Centers for Medicare and Medicaid Services (CMS) (see section 1.1 and 1.2 of the measure testing form), the measure specifications and software are specified to be used with any ICD-10-CM-coded administrative billing/claims/discharge dataset with Present on Admission (POA) information.

LEVEL

Facility

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

PSI 03: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for pressure ulcer stage III or IV (or unstageable).

PSI 06: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for iatrogenic pneumothorax.

PSI 08: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for hip fracture.

PSI 09: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with: any secondary ICD-10-CM diagnosis codes for perioperative hemorrhage or hematoma and any-listed ICD-10-CM procedure codes for treatment of hemorrhage or hematoma (Note: The ICD-10-CM specification is limited to postoperative hemorrhage or hematoma).

PSI 10: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for acute renal failure and any-listed ICD-10-CM procedure codes for dialysis.

PSI 11: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with either: any secondary ICD-10-CM diagnosis code for acute respiratory failure; or any-listed ICD-10-CM procedure codes for a mechanical ventilation for 96 consecutive hours or more that occurs zero or more days after the first major operating room procedure code (based on days from admission to procedure); or any-listed ICD-10-CM procedure codes for a mechanical ventilation for less than 96 consecutive hours (or undetermined) that occurs two or more days after the first major operating room procedure code (based on days from admission to procedure); or any-listed ICD-10-CM procedure codes for a reintubation that occurs one or more days after the first major operating room procedure code (based on days from admission to procedure).

PSI 12: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with a secondary ICD-10-CM diagnosis code for proximal deep vein thrombosis or a secondary ICD-10-CM diagnosis code for pulmonary embolism.

PSI 13: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for sepsis.

PSI 14: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any-listed ICD-10-PCS procedure codes for repair of the abdominal wall and any-listed ICD-10-CM diagnosis code for disruption of internal surgical wound

PSI 15: Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with any secondary ICD-10-CM diagnosis codes for accidental puncture or laceration during a procedure and second abdominopelvic operation >=1 day after an index abdominopelvic operation.

NUMERATOR DETAILS

See attached technical specifications for complete list of numerator details, which are also available at:

https://www.qualitynet.org/inpatient/measures/psi/resources and https://www.qualitynet.org/files/5ebeeee9641cb00023dd1f96?filename=2019_PSI_TechSpecs_Excel.zip

DENOMINATOR STATEMENT

PSI 03: Surgical or medical discharges, for patients ages 18 years and older. Surgical and medical discharges are defined by specific MS-DRG codes.

PSI 06: Surgical and medical discharges, for patients ages 18 years and older. Surgical and medical discharges are defined by specific MS-DRG codes.

PSI 08: Discharges, for patients ages 18 years and older, in a medical DRG or in a surgical DRG, with any listed ICD-10-PCS procedure codes for an operating room procedure.

PSI 09: Surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Surgical discharges are defined by specific MS-DRG codes.

PSI 10: Elective surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Elective surgical discharges are defined by specific MS-DRG codes with admission type recorded as elective.

PSI 11: Elective surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Elective surgical discharges are defined by specific MS-DRG codes with admission type recorded as elective.

PSI 12: Surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Surgical discharges are defined by specific MS-DRG codes.

PSI 13: Elective surgical discharges, for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure. Elective surgical discharges are defined by specific MS-DRG codes with admission type recorded as elective.

PSI 14: Discharges, for patients ages 18 years and older, with any-listed ICD-10-CM procedure codes for abdominopelvic surgery, open approach, or with any-listed ICD-10-PCS procedure codes for abdominopelvic surgery, other than open approach.

PSI 15: Surgical and medical discharges, for patients ages 18 years and older, with any ICD-10-PCS procedure code for an abdominopelvic procedure

DENOMINATOR DETAILS

The attached technical specifications and appendices include a complete list of denominator codes and details, which are also available at: https://www.qualitynet.org/files/5ebeeee9641cb00023dd1f96?filename=2019_PSI_TechSpecs_Excel.zip

PSI 03: See PSI Appendix B - Medical Discharge MS-DRGs and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 06: See PSI Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 08: See PSI Appendix A - Operating Room Procedure Codes, Appendix B - Medical Discharge MS-DRGs and Appendix C - Surgical Discharge MS-DRGs for the full list of codes, and Appendix E - excluded Trauma Diagnosis Codes

PSI 09: See PSI Appendix A - Operating Room Procedure Codes and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 10: See PSI Appendix A - Operating Room Procedure Codes and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 11: See PSI Appendix A - Operating Room Procedure Codes and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 12: See PSI Appendix A - Operating Room Procedure Codes and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 13: See PSI Appendix A - Operating Room Procedure Codes and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

PSI 14: see attached technical specifications for the full list of codes

PSI 15: see attached technical specifications plus Appendix B - Medical Discharge MS-DRGs and Appendix C - Surgical Discharge MS-DRGs for the full list of codes

EXCLUSIONS

PSI 03:

- Length of stay of less than 3 days
- Principal ICD-10-CM diagnosis code for pressure ulcer stage III or IV (or unstageable)
- All secondary ICD-10-CM diagnosis codes for pressure ulcer III or IV (or unstageable) present on admission. If more than one diagnosis of pressure ulcer is present, all diagnoses must be present on admission for the discharge to be excluded
- Any listed ICD-10-CM diagnosis code for severe burns (>20% body surface area)

- Any listed ICD-10-CM diagnosis code for exfoliative disorders of the skin (>20% body surface area)
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 06:

- Principal ICD-10-CM diagnosis code for iatrogenic pneumothorax
- Any secondary ICD-10-CM diagnosis code for iatrogenic pneumothorax present on admission, among patients qualifying for the numerator
- Any listed ICD-10-CM diagnosis codes for specified chest trauma (rib fractures, traumatic pneumothorax and related chest wall injuries)
- Any listed ICD-10-CM diagnosis codes for pleural effusion
- Any listed ICD-10-PCS procedure codes for thoracic surgery
- Any listed ICD-10-CM procedure codes for cardiac procedure;
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 08:

- Principal ICD-10-CM diagnosis code for hip fracture
- Any secondary ICD-10-CM diagnosis code for hip fracture present on admission, among patients otherwise qualifying for the numerator
- Principal ICD-10-CM diagnosis code for seizure
- Principal ICD-10-CM diagnosis code for syncope
- Principal ICD-10-CM diagnosis code for stroke and occlusion of arteries
- Principal ICD-10-CM diagnosis code for coma
- Principal ICD-10-CM diagnosis code for cardiac arrest
- Principal ICD-10-CM diagnosis code for poisoning
- Principal ICD-10-CM diagnosis code for trauma
- Principal ICD-10-CM diagnosis code for delirium and other psychoses
- Principal ICD-10-CM diagnosis code for anoxic brain injury
- Any listed ICD-10-CM diagnosis codes for metastatic cancer
- Any listed ICD-10-CM diagnosis codes for lymphoid malignancy
- Any listed ICD-10-CM diagnosis codes for bone malignancy
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 09:

- Principal ICD-10-CMS diagnosis code for perioperative hemorrhage or postoperative hematoma
- Any secondary ICD-10-CM diagnosis present on admission for perioperative hemorrhage or postoperative hematoma, among discharges that otherwise qualify for the numerator
- The only operating room procedure is for treatment of perioperative hemorrhage, or hematoma and with any secondary ICD-10-CM diagnosis codes for perioperative hemorrhage or hematoma
- Treatment of postoperative hemorrhage or hematoma occurs one day or more before the first operating room procedure, and with any secondary ICD-10-CM diagnosis codes for postoperative hemorrhage or hematoma
- With any listed ICD-10-CM diagnosis codes for coagulation disorders

- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 10:

- Principal ICD-10-CM diagnosis code for acute renal failure, cardiac arrest, cardiac dysrhythmia, shock or chronic kidney failure
- Any secondary ICD-10-CM diagnosis code for acute kidney failure, cardiac arrest, cardiac dysrhythmia, shock or chronic kidney failure, present on admission, among patients otherwise qualifying for the numerator
- Any dialysis procedure that occurs before or on the same day as the first operating room procedure
- Any dialysis access procedure occurring before or on the same day as the first operating room procedure
- Principal ICD-10-CM (or secondary diagnosis present on admission) for urinary tract obstruction
- Any ICD-10-CM diagnosis code present on admission for solitary kidney disease and any ICD-10-PCS procedure code for partial nephrectomy
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 11:

- Principal ICD-10-CM diagnosis code for acute respiratory failure
- Any secondary ICD-10-CM diagnosis code for respiratory failure present on admission, among patients otherwise qualifying for the numerator
- Only operating room procedure is tracheostomy
- Procedure for tracheostomy occurs before the first operating room procedure
- Any listed ICD-10-CM diagnosis codes for neuromuscular disorder
- Any listed ICD-10-PCS procedure codes for laryngeal or pharyngeal, nose, mouth pharynx or facial surgery
- Any listed ICD-10-CM procedure codes for esophageal resection
- Any listed ICD-10-CM procedure codes for lung cancer
- Any listed ICD-10-CM diagnosis codes for degenerative neurological disorder
- Any listed ICD-10-CM procedure codes for lung transplant
- MDC 4 (diseases/disorders of respiratory system);
- MDC 5 (diseases/disorders of circulatory system);
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 12:

- Principal ICD-10-CM diagnosis code for proximal deep vein thrombosis (DVT) or pulmonary embolism (PE),
- Any secondary ICD-10-CM diagnosis code for DVT or PE present on admission, among patients otherwise qualifying for the numerator
- Procedure for interruption of vena cava occurs before or on the same day as the first operating room procedure
- Only operating room procedure was interruption of vena cava
- Any listed ICD-10-CM diagnosis code for acute brain or spinal injury present on admission

- Any listed ICD-10-PCS procedure code for extracorporeal membrane oxygenation (ECMO)
- Procedure for pulmonary arterial thrombectomy occurs before or on the same day as the first operating room procedure
- Only operating room procedure was for pulmonary arterial thrombectomy
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 13:

- Principal ICD-10-CM diagnosis code for sepsis or infection
- Any secondary ICD-10-CM diagnosis code for sepsis or infection present on admission, among patients otherwise qualifying for the numerator
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 14:

- Procedure for abdominal wall reclosure occurs on or before the day of the first open abdominopelvic surgery procedure, if any, and the day of the first laparoscopic abdominopelvic surgery procedure, if any
- Any listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state
- Principal ICD-10-CM diagnosis code for disruption of internal operation wound
- Any secondary ICD-10-CM diagnosis code for disruption of internal operation wound present on admission
- Length of stay less than two (2) days-MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

PSI 15:

- Principal ICD-10-CM diagnosis code for accidental puncture or lacerations during a procedure
- Any secondary ICD-10-CM diagnosis code for accidental puncture or laceration during a procedure, among patients otherwise qualifying for the numerator
- MDC 14 (pregnancy, childbirth, and puerperium)
- Missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

EXCLUSION DETAILS

PSI 03: For a complete list of excluded codes, see attached technical specifications

PSI 06: For a complete list of excluded codes, see attached technical specifications

PSI 08: For a complete list of excluded codes, see attached technical specifications

PSI 09: For a complete list of excluded codes, see attached technical specifications

PSI 10: For a complete list of excluded codes, see attached technical specifications

PSI 11: For a complete list of excluded codes, see attached technical specifications

PSI 12: For a complete list of excluded codes, see attached technical specifications

PSI 13: For a complete list of excluded codes, see attached technical specifications and PSI Appendix D – Infection Diagnosis Codes

PSI 14: For a complete list of excluded codes, see attached technical specifications and PSI Appendix F – Immunocompromised State Diagnosis and Procedure Codes

PSI 15: For a complete list of excluded codes, see attached technical specifications

Excluded codes for all components are also available at: https://www.qualitynet.org/inpatient/measures/psi/resources and https://www.qualitynet.org/files/5ebeeee9641cb00023dd1f96?filename=2019_PSI_TechSpecs_Excel.zip

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

Not applicable.

TYPE SCORE

Other (specify): Observed to expected ratio (component measures); Weighted average of the smoothed (empirical Bayes shrinkage) risk standardized observed to expected ratios (composite) better quality = lower score

ALGORITHM

For each component: The observed rate is the number of discharge records where the patient experienced the adverse event divided by the number of discharge records at risk for the event. The expected rate is a comparative rate that incorporates information about a reference population that is not part of the user's input dataset – what rate would be observed if the expected level of care observed in the reference population and estimated with risk adjustment regression models, were applied to the mix of patients with demographic and comorbidity distributions observed in the user's dataset? The expected rate is calculated only for risk-adjusted indicators.

The expected rate is estimated for each person using a generalized estimating equations (GEE) approach to account for correlation at the hospital or provider level.

The risk-adjusted rate is a comparative rate that also incorporates information about a reference population that is not part of the input dataset – what rate would be observed if the level of care observed in the user's dataset were applied to a mix of patients with demographics and comorbidities distributed like the reference population? The risk adjusted rate is calculated using the indirect method as observed rate divided by expected rate multiplied by the reference population rate. The smoothed rate is the weighted average of the risk-adjusted rate from the user's input dataset and the rate observed in the reference population; the smoothed rate is calculated with a shrinkage estimator to result in a rate near that from the user's dataset if the provider's rate is estimated in a stable fashion with minimal noise, or to result in a rate near that of the reference population if the variance of the estimated rate from the input dataset is large compared with the hospital-to-hospital variance estimated from the reference population. Thus, the smoothed rate is a weighted average of the risk-adjusted rate and the reference population rate, where the weight is the signal-to-noise ratio. In practice, the smoothed rate brings rates toward the mean, and tends to do this more so for outliers (such as rural hospitals)

The composite measure is a weighted average of the smoothed (empirical Bayes shrinkage) indirectly standardized morbidity ratios (observed to expected ratios) of the component

indicators. The final weight for each component is based on two concepts: the volume of the adverse event and the harm associated with the adverse event.

The volume weights were calculated based on the number of safety-related events for the component indicators in the fee-for-service reference population. The harm weights were calculated by multiplying empirical estimates of the probability of excess harms associated with each patient safety event by the corresponding utility weights (1–disutility). Disutility is the measure of the severity of the adverse events associated with each of the harms (i.e., outcome severity, or least preferred states from the patient perspective). These excess harm probabilities were estimated by comparing patients with a safety-related event to very similar, otherwise eligible patients without that safety-related event over up to 1 year after the discharge during which the index event happened. Linked claims data for 2 years of Medicare Fee for Service beneficiaries (2016 - 2018) were used for this analysis. To account for confounders in estimating the marginal impact of each PSI on the risk of excess harms, inverse probability propensity weighting with indicator- and harm-specific propensity models were calculated that included age, sex, racial/ethnic categories, Medicaid eligibility, point of origin, modified Medicare Severity–Diagnosis-Related Group categories, Elixhauser comorbidities, and co-occurring PSIs.

CMS PSI 90 results center on 1.0 to improve interpretability. This means that the CMS PSI 90 composite value of the entire population of the input data equals 1.0. Hospital-level CMS PSI 90 results can be compared with 1.0. Adjusting for case mix, a CMS PSI 90 composite value less than 1.0 indicates a value better than the average of the reference population; likewise, a CMS PSI 90 composite value greater than 1.0 indicates a value worse than the average of the reference population. 132112| 138848| 138827| 113780| 149896| 146433| 150289| 152494

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1893 Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

STEWARD

Centers for Medicare & Medicaid Services

DESCRIPTION

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

TYPE

Outcome

DATA SOURCE

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

LEVEL

Facility

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

NUMERATOR DETAILS

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

DENOMINATOR STATEMENT

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

DENOMINATOR DETAILS

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

EXCLUSIONS

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

EXCLUSION DETAILS

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

N/A

TYPE SCORE

Rate/proportion better quality = lower score

ALGORITHM

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are

described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226. 112469| 118210| 146637| 150289

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N/A

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

STEWARD

National Committee for Quality Assurance

DESCRIPTION

The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure:

- Rate 1: The percentage of those with a history of falls that received a potentially harmful medication
- Rate 2: The percentage of those with dementia that received a potentially harmful medication
- Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication

A lower rate represents better performance for all rates.

TYPE

Process

DATA SOURCE

Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.

LEVEL

Health Plan

SETTING

Outpatient Services

NUMERATOR STATEMENT

Numerator 1: Patients with a history of falls who received at least one potentially harmful medication from Table DDE-A or Table DDE-B

Numerator 2: Patients with a diagnosis of dementia who received at least one potentially harmful medication from Table DDE-D

Numerator 3: Patients with chronic kidney disease who received at least one potentially harmful medication from Table DDE-E

NUMERATOR DETAILS

Rate 1 numerator: Dispensed an ambulatory prescription for an anticonvulsant, SSRI, or SNRI (Table DDE-A), or antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B) on or between the index episode start date (IESD) and December 31 of the measurement year.

Rate 2 numerator: Dispensed an ambulatory prescription for an antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B), or anticholinergic agent (Table DDE-D) on or between the IESD and December 31 of the measurement year.

Rate 3 numerator: Dispensed an ambulatory prescription for a Cox-2 selective NSAID or nonaspirin NSAID (Table DDE-E) on or between the IESD and December 31 of the measurement year.

Note: Do not include denied claims.

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

…

Table DDE-A: Potentially Harmful Drugs – Rate 1

Anticonvulsants:

Carbamazepine, Clobazam, Divalproex sodium, Ethosuximide, Ethotoin, Ezogabine, Felbamate, Fosphenytoin, Gabapentin, Lacosamide, Lamotrigine, Levetiracetam, Methsuximide, Oxcarbazepine, Phenobarbital, Phenytoin, Pregabalin, Primidone, Rufinamide, Tiagabine HCL, Topiramate, Valproate sodium, Valproic acid, Vigabatrin, Zonisamide

SNRIs:

Desvenlafaxine, Duloxetine, Levomilnacipran, Venlafaxine

SSRIs:

Citalopram, Escitalopram, Fluoxetine, Fluvoxamine, Paroxetine, Setraline

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Table DDE-B: Potentially Harmful Drugs – Rate 1 (History of Falls) and Rate 2 (Dementia)

Antipsychotics:

Aripiprazole, Asenapine, Brexpiprazole, Cariprazine, Chlorpromazine, Clozapine, Fluphenazine, Haloperidol, Iloperidone, Loxapine, Lurasidone, Molindone, Olanzapine, Paliperidone,

Perphenazine, Pimozide, Quetiapine, Risperidone, Thioridazine, Thiothixene, Trifluoperazine, Ziprasidone

Benzodiazepine hypnotics:

Alprazolam, Chlordiazepoxide products, Clonazepam, Clorazepate-Dipotassium, Diazepam, Estazolam, Flurazepam HCL, Lorazepam, Midazolam HCL, Oxazepam, Quazepam, Temazepam, Triazolam

Nonbenzodiazepine hypnotics:

Eszopiclone, Zaleplon, Zolpidem

Tricyclic antidepressants:

Amitriptyline, Amoxapine, Clomipramine, Desipramine, Doxepin (>6 mg), Imipramine, Nortriptyline, Protriptyline, Trimipramine

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Table DDE-D: Potentially Harmful Drugs – Rate 2 (Dementia)

Anticholinergic agents, antiemetics:

Prochlorperazine, Promethazine

Anticholinergic agents, antihistamines:

Brompheniramine, Carbinoxamine, Chlorpheniramine, Hydroxyzine, Clemastine, Cyproheptadine, Pyrilamine, Triprolidine, Dimenhydrinate, Diphenhydramine, Meclizine, Dexbrompheniramine, Dexchlorpheniramine, Doxylamine

Anticholinergic agents, antispasmodic:

Atropine, Homatropine, Belladonna alkaloids, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine, Clidinium-chlordiazepoxide

Anticholinergic agents, antimuscarinics (oral)

Darifenacin, Fesoterodine, Solifenacin, Trospium, Flavoxate, Oxybutynin, Tolterodine

Anticholinergic agents, anti-Parkinson agents

Benztropine, Trihexyphernidyl

Anticholinergic agents, skeletal muscle relaxants

Cyclobenzaprine, Orphenadrine

Anticholinergic agents, SSRIs:

Paroxetine

Anticholinergic agents, antiarrhythmic:

Disopyramide

Table DDE-E: Cox-2 Selective NSAIDs and Nonasprin NSAIDs

Cox-2 Selective NSAIDs:

Celecoxib

Nonaspirin NSAIDs:

Diclofenac potassium, Diclofenac sodium, Etodolac, Fenoprofen, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Ketorolac, Meclofenamate, Mefenamic acid, Meloxicam, Nabumetone, Naproxen, Naproxen sodium, Oxaprozin, Piroxicam, Sulindac, Tolmetin

DENOMINATOR STATEMENT

All patients 65 years of age and older with a history of falls, dementia or chronic kidney disease in the measurement year or the year prior to the measurement year.

DENOMINATOR DETAILS

All patients ages 67 years and older as of December 31 of the measurement year with a history of falls, dementia or chronic kidney disease. Each of the three rates in the measure has a different denominator:

Rate 1 denominator: Patients with an accidental fall or hip fracture (Note: hip fractures are used as a proxy for identifying accidental falls). Individuals with either of the following on or between January 1 of the year prior to the measurement year and December 1 of the measurement year meet criteria:

- An accidental fall (Falls Value Set).
- An acute inpatient encounter (Acute Inpatient Value Set), nonacute inpatient encounter (Nonacute Inpatient Value Set), outpatient visit (Outpatient Value Set), an observation visit (Observation Value Set) or an ED visit (ED Value Set) with a hip fracture (Hip Fractures Value Set).
- An acute or nonacute inpatient discharge with a hip fracture (Hip Fractures Value Set). To identify acute and nonacute inpatient discharges: 1) Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2) Identify the discharge date for the stay. 3) Identify the index episode start date (IESD) for each patient.

Rate 2 denominator: Patients with a diagnosis of dementia (Dementia Value Set) or a dispensed dementia medication (Table DDE-C) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient.

Rate 3 denominator: Patients with chronic kidney disease as identified by a diagnosis of ESRD (ESRD Value Set), dialysis (Dialysis Procedure Value Set), stage 4 chronic kidney disease (CKD Stage 4 Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

Note: Patients with more than one disease or condition may appear in the measure multiple times (i.e., in each indicator for which they qualify).

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

See S.2.b for all Value Sets

Table DDE-C: Prescriptions to Identify Members with Dementia

Cholinesterase inhibitors:

Donepezil, Galantamine, Rivastigmine

Miscellaneous central nervous system agents:

Memantine

EXCLUSIONS

For those who meet denominator criteria for the history of falls rate (Rate 1): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder or seizure disorder.

For those who meet denominator criteria for the dementia rate (Rate 2): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder or bipolar disorder.

EXCLUSION DETAILS

For those who meet denominator criteria for the history of falls rate (Rate 1): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set), bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set), major depressive disorder (Major Depression or Dysthymia Value Set) or seizure disorder (Seizure Disorders Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For those who meet denominator criteria for the dementia rate (Rate 2): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set) or bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

RISK ADJUSTMENT

No risk adjustment or risk stratification

STRATIFICATION

No risk adjustment or risk stratification

TYPE SCORE

Rate/proportion better quality = lower score

ALGORITHM

Step 1. Determine the eligible population: All patients 67 years of age and older as of the end (i.e., December 31) of the measurement year.

Step 2: Identify the denominators for each of the three rates:

Rate 1: Those in the eligible population with a history of falls (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, bipolar disorder, major depressive disorder, or seizure disorder (see S.9 for details). Identify the index episode start date (IESD) for each patient.

Rate 2: Those in the eligible population with dementia (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, or bipolar disorder (see S.9 for details). Identify the IESD for each patient.

Rate 3: Those in the eligible population with chronic kidney disease (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient.

Step 3: Identify the numerators: Individuals in each of the denominators who have received at least one potentially harmful medication on or after the IESD (see definitions of potentially harmful medications for each numerator in section S.5).

Step 4: Calculate the rates:

Rate 1 – Numerator 1 divided by denominator 1.

Rate 2 – Numerator 2 divided by denominator 2.

Rate 3 – Numerator 3 divided by denominator 3.

Note: For this measure, a lower rate indicates better performance for all three rates.

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date. 123834| 150289

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Appendix E1: Related and Competing Measures (tabular format)

Comparison of NQF 0022 and NQF 2993

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
Steward	National Committee for Quality Assurance	National Committee for Quality Assurance
Description	The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance.	The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure: - Rate 1: The percentage of those with a history of falls that received a potentially harmful medication - Rate 2: The percentage of those with dementia that received a potentially harmful medication - Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication A lower rate represents better performance for all rates.
Type	Process	Process
Data Source	Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.	Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.
Level	Health Plan	Health Plan
Setting	Outpatient Services	Outpatient Services
Numerator Statement	Patients who received at least two dispensing events for the same high-risk medication during the measurement year.	Numerator 1: Patients with a history of falls who received at least one potentially harmful medication from Table DDE-A or Table DDE-B Numerator 2: Patients with a diagnosis of dementia who received at least one potentially harmful medication from Table DDE-D Numerator 3: Patients with chronic kidney disease who received at least one potentially harmful medication from Table DDE-E

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
Numerator Details	Patients who had at least two dispensing events for the same high-risk medication during the measurement year. Follow the steps below to identify numerator compliance. Include patients who meet criteria in more than one step only once in the numerator. Do not include denied claims. Step 1: Identify patients with two or more dispensing events (any days supply) on different dates of service during the measurement year for a medication in Table DAE-A. The dispensing events must be for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. Step 2: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-B. Identify patients with two or more dispensing events on different dates of service for medications in the same medication class (as defined by the AGS Beers Criteria Table 2 and class title below). For example, a prescription for zolpidem and a prescription for zaleplon are considered two dispensing events for medications in the same medication class (these drugs share the same class title or description: Nonbenzodiazepine hypnotics). Sum the days supply for prescriptions in the same medication class. Identify patients with two or more dispensing events for medications of the same medication class where the summed days supply exceeds the days supply criteria listed for the medication. These patients are numerator compliant. For medications dispensed during the measurement year sum the days supply and include any days supply that extends beyond December 31 of the measurement year. For example, a prescription of a 90-days supply dispensed on December 1 of the measurement year counts as a 90-days supply. - Note: The intent is to identify all patients who had multiple dispensing events where the summed days supply exceeds the days supply criteria; there is no requirement that each dispensing event exceed the days supply criteria. Step 3: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-C where average daily dose exceeds the average daily dose criteria listed for the medication. Identify patients with two or more dispensing events on different dates of service that exceed the average daily dose	Rate 1 numerator: Dispensed an ambulatory prescription for an anticonvulsant, SSRI, or SNRI (Table DDE-A), or antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B) on or between the index episode start date (IESD) and December 31 of the measurement year. Rate 2 numerator: Dispensed an ambulatory prescription for an antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B), or anticholinergic agent (Table DDE-D) on or between the IESD and December 31 of the measurement year. Rate 3 numerator: Dispensed an ambulatory prescription for a Cox-2 selective NSAID or nonaspirin NSAID (Table DDE-E) on or between the IESD and December 31 of the measurement year. Note: Do not include denied claims. Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year. For an outpatient claim/encounter, the IESD is the date of service. For an inpatient claim/encounter, the IESD is the discharge date. For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service. For dispensed prescriptions, the IESD is the dispense date. … Table DDE-A: Potentially Harmful Drugs – Rate 1 Anticonvulsants: Carbamazepine, Clobazam, Divalproex sodium, Ethosuximide, Ethotoin, Ezogabine, Felbamate, Fosphenytoin, Gabapentin, Lacosamide, Lamotrigine, Levetiracetam, Methsuximide, Oxcarbazepine, Phenobarbital, Phenytoin, Pregabalin, Primidone, Rufinamide, Tiagabine HCL, Topiramate, Valproate sodium, Valproic acid, Vigabatrin, Zonisamide SNRIs: Desvenlafaxine, Duloxetine, Levomilnacipran, Venlafaxine SSRIs:

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
	criteria for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. To calculate average daily dose for each dispensing event, multiply the quantity of pills dispensed by the dose of each pill and divide by the days supply. For example, a prescription for a 30-days supply of digoxin containing 15 pills, .250 mg each pill, has an average daily dose of 0.125 mg. To calculate average daily dose for elixirs and concentrates, multiply the volume dispensed by daily dose and divide by the days supply. Do not round when calculating average daily dose. HIGH-RISK MEDICATIONS (Table DAE-A) Anticholinergics, First-generation antihistamines--- Brompheniramine, Carbinoxamine, Chlorpheniramine, Clemastine, Cyproheptadine, Dexbrompheniramine, Dexchlorpheniramine, Diphenhydramine (oral), Dimenhydrinate, Doxylamine, Hydroxyzine, Meclizine, Promethazine, Pyrilamine, Triprolidine Anticholinergics, anti-Parkinson agents--- Benztropine (oral), Trihexyphenidyl Antispasmodics--- Atropine (exclude ophthalmic), Bellandonna alkaloids, Clidinium-Chlordiazepoxide, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine Antithrombotics--- Dipyridamole, oral short-acting (does not apply to the extended-release combination with aspirin) Cardiovascular, alpha agonists, central--- Guanabenz, Guanfacine, Methyldopa Cardiovascular, other--- Disopyramide, Nifedipine (immediate release) Central nervous system, antidepressants--- Amitriptyline, Clomipramine, Imipramine, Trimipramine, Amoxapine, Desipramine, Nortiptyline, Paroxetine, Protriptyline Central nervous system, barbiturates--- Amobarbital, Butabarbital, Butalbital, Mephobarbital, Pentobarbital, Phenobarbital, Secobarbital	Citalopram, Escitalopram, Fluoxetine, Fluvoxamine, Paroxetine, Setraline --- Table DDE-B: Potentially Harmful Drugs – Rate 1 (History of Falls) and Rate 2 (Dementia) Antipsychotics: Aripiprazole, Asenapine, Brexpiprazole, Cariprazine, Chlorpromazine, Clozapine, Fluphenazine, Haloperidol, Iloperidone, Loxapine, Lurasidone, Molindone, Olanzapine, Paliperidone, Perphenazine, Pimozide, Quetiapine, Risperidone, Thioridazine, Thiothixene, Trifluoperazine, Ziprasidone Benzodiazepine hypnotics: Alprazolam, Chlordiazepoxide products, Clonazepam, Clorazepate-Dipotassium, Diazepam, Estazolam, Flurazepam HCL, Lorazepam, Midazolam HCL, Oxazepam, Quazepam, Temazepam, Triazolam Nonbenzodiazepine hypnotics: Eszopiclone, Zaleplon, Zolpidem Tricyclic antidepressants: Amitriptyline, Amoxapine, Clomipramine, Desipramine, Doxepin (>6 mg), Imipramine, Nortriptyline, Protriptyline, Trimipramine --- Table DDE-D: Potentially Harmful Drugs – Rate 2 (Dementia) Anticholinergic agents, antiemetics: Prochlorperazine, Promethazine Anticholinergic agents, antihistamines: Brompheniramine, Carbinoxamine, Chlorpheniramine, Hydroxyzine, Clemastine, Cyproheptadine, Pyrilamine, Triprolidine, Dimenhydrinate, Diphenhydramine, Meclizine, Dexbromphenirmine, Dexchlorpheniramine, Doxylamine Anticholinergic agents, antispasmodic: Atropine, Homatropine, Belladonna alkaloids, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine, Clidinium-chlordiazepoxide Anticholinergic agents, antimuscarinics (oral)

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
	Central nervous system, vasodilators--- Ergot mesylates, Isoxsuprine Central nervous system, other--- Meprobamate Endocrine system, estrogens with or without progestins; include only oral and topical patch products--- Conjugated estrogen, Esterified estrogen, Estradiol, Estropipate Endocrine system, sulfonylureas, long-duration--- Chlorpropamide, Glimepiride, Glyburide Endocrine system, other--- Desiccated thyroid, Megestrol Pain medications, skeletal muscle relaxants--- Carisoprodol, Chlorzoxazone, Cyclobenzaprine, Metaxalone, Methocarbamol, Orphenadrine Pain medications, other--- Indomethacin, Ketorolac (includes parenteral), Meperidine --- HIGH-RISK MEDICATIONS WITH DAYS SUPPLY CRITERIA (Table DAE-B) Anti-infectives, other (greater than 90 days supply, days supply criteria)--- Nitrofurantoin, Nitrofurantoin macrocrystals, Nitrofurantoin macrocrystals-monohydrate Nonbenzodiazepine hypnotics (greater than 90 days supply, days supply criteria)--- Eszopiclone, Zolpidem, Zaleplon --- HIGH-RISK MEDICATIONS WITH AVERAGE DAILY DOSE CRITERIA (Table DAE-C) Alpha agonists, central (greater than 0.1 mg/day, average daily dose criteria)--- Reserpine Cardiovascular, other (greater than 0.125 mg/day, average daily dose criteria)---	Darifenacin, Fesoterodine, Solifenacin, Trospium, Flavoxate, Oxybutynin, Tolterodine Anticholinergic agents, anti-Parkinson agents Benztropine, Trihexyphernidyl Anticholinergic agents, skeletal muscle relaxants Cyclobenzaprine, Orphenadrine Anticholinergic agents, SSRIs: Paroxetine Anticholinergic agents, antiarrhythmic: Disopyramide --- Table DDE-E: Cox-2 Selective NSAIDs and Nonasprin NSAIDs Cox-2 Selective NSAIDs: Celecoxib Nonaspirin NSAIDs: Diclofenac potassium, Diclofenac sodium, Etodolac, Fenoprofen, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Ketorolac, Meclofenamate, Mefenamic acid, Meloxicam, Nabumetone, Naproxen, Naproxen sodium, Oxaprozin, Piroxicam, Sulindac, Tolmetin

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
	Digoxin Tertiary TCAs (as single agent or as part of combination products), (greater than 6 mg/day, average daily dose criteria)--- Doxepin --- Note: NCQA will post a comprehensive list of medications and NDC codes to www.ncqa.org by November 2020. For medications in Table DAE-A and DAE-C, identify different drugs using the Drug ID field located in the NDC list on NCQA's Web site (www.ncqa.org), posted by November 2020.	
Denominator Statement	All patients 65 years of age and older.	All patients 65 years of age and older with a history of falls, dementia or chronic kidney disease in the measurement year or the year prior to the measurement year.
Denominator Details	All patients that are 66 years of age and older as of December 31 of the measurement year.	All patients ages 67 years and older as of December 31 of the measurement year with a history of falls, dementia or chronic kidney disease. Each of the three rates in the measure has a different denominator: Rate 1 denominator: Patients with an accidental fall or hip fracture (Note: hip fractures are used as a proxy for identifying accidental falls). Individuals with either of the following on or between January 1 of the year prior to the measurement year and December 1 of the measurement year meet criteria: - An accidental fall (Falls Value Set). - An acute inpatient encounter (Acute Inpatient Value Set), nonacute inpatient encounter (Nonacute Inpatient Value Set), outpatient visit (Outpatient Value Set), an observation visit (Observation Value Set) or an ED visit (ED Value Set) with a hip fracture (Hip Fractures Value Set). - An acute or nonacute inpatient discharge with a hip fracture (Hip Fractures Value Set). To identify acute and nonacute inpatient discharges: 1) Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2) Identify the discharge date for the stay. 3) Identify the index episode start date (IESD) for each patient. Rate 2 denominator: Patients with a diagnosis of dementia (Dementia Value Set) or a dispensed dementia medication (Table

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
		DDE-C) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient. Rate 3 denominator: Patients with chronic kidney disease as identified by a diagnosis of ESRD (ESRD Value Set), dialysis (Dialysis Procedure Value Set), stage 4 chronic kidney disease (CKD Stage 4 Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. ------- Note: Patients with more than one disease or condition may appear in the measure multiple times (i.e., in each indicator for which they qualify). Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year. For an outpatient claim/encounter, the IESD is the date of service. For an inpatient claim/encounter, the IESD is the discharge date. For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service. For dispensed prescriptions, the IESD is the dispense date. See S.2.b for all Value Sets Table DDE-C: Prescriptions to Identify Members with Dementia Cholinesterase inhibitors: Donepezil, Galantamine, Rivastigmine Miscellaneous central nervous system agents: Memantine
Exclusions	Patients who were enrolled in hospice care at any time during the measurement year.	For those who meet denominator criteria for the history of falls rate (Rate 1): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder or seizure disorder.

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
		For those who meet denominator criteria for the dementia rate (Rate 2): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder or bipolar disorder.
Exclusion Details	N/A	For those who meet denominator criteria for the history of falls rate (Rate 1): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set), bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set), major depressive disorder (Major Depression or Dysthymia Value Set) or seizure disorder (Seizure Disorders Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. For those who meet denominator criteria for the dementia rate (Rate 2): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set) or bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	N/A	No risk adjustment or risk stratification
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	Step 1. Determine the denominator: All patients 66 years of age and older as of the end (i.e., December 31) of the measurement year. Step 2: Identify the numerator: Individuals in the denominator who have dispensed at least two prescriptions for the same high-risk medication (see definition of high-risk medication in section S.6) during the measurement year. Step 3: Divide Step 2 (numerator) by Step 1 (denominator) to calculate the rate. Note: For this measure, a lower rate indicates better performance. 123834| 140881| 150289	Step 1. Determine the eligible population: All patients 67 years of age and older as of the end (i.e., December 31) of the measurement year. Step 2: Identify the denominators for each of the three rates: Rate 1: Those in the eligible population with a history of falls (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, bipolar disorder, major depressive disorder, or seizure disorder (see S.9 for details). Identify the index episode start date (IESD) for each patient. Rate 2: Those in the eligible population with dementia (see S.7 for details) on or between January 1 of the year prior to the

Measure	0022 Use of High-Risk Medications in Older Adults (DAE)	2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
		measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, or bipolar disorder (see S.9 for details). Identify the IESD for each patient. Rate 3: Those in the eligible population with chronic kidney disease (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient. Step 3: Identify the numerators: Individuals in each of the denominators who have received at least one potentially harmful medication on or after the IESD (see definitions of potentially harmful medications for each numerator in section S.5). Step 4: Calculate the rates: Rate 1 – Numerator 1 divided by denominator 1. Rate 2 – Numerator 2 divided by denominator 2. Rate 3 – Numerator 3 divided by denominator 3. Note: For this measure, a lower rate indicates better performance for all three rates. Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year. For an outpatient claim/encounter, the IESD is the date of service. For an inpatient claim/encounter, the IESD is the discharge date. For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service. For dispensed prescriptions, the IESD is the dispense date. 123834|150289
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Comparison of NQF 0097 and NQF 0419e

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
Steward	National Committee for Quality Assurance	Centers for Medicare & Medicaid Services
Description	The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).	For both the 2018 claims and registry specifications AND the 2019 performance period eMeasure (v8) the measure description is as follows: Percentage of visits for patients aged 18 years and older for which the eligible professional or eligible clinician attests to documenting a list of current medications using all immediate resources available on the date of the encounter. This list must include ALL known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency and route of administration.
Type	Process	Process
Data Source	Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system. No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx	Claims, Electronic Health Records, Registry Data The data source is the medical record, which provides patient information for the encounter; Medicare Part B Claims and Registry data, and EHR reports. No data collection instrument provided Attachment CMS68_QI130_NQF0419_NQF_AU_2018_S_2b__Code_Table_121218.xlsx
Level	Health Plan	Clinician : Group/Practice, Clinician : Individual
Setting	Outpatient Services	Outpatient Services
Numerator Statement	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).	Numerator statements for both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8) is as follows: Eligible professional or eligible clinician attests to documenting, updating, or reviewing the patient´s current medications using all immediate resources available on the date of the encounter. This list must include ALL prescriptions, over-the counters, herbals, vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosages, frequency, and route of administration.
Numerator Details	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or	2018 claims and registry specifications: The numerator Quality-Data Coding Options for Reporting Satisfactorily:

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record. This measure is specified for medical record or administrative data collection. Medical Record Reporting Details: Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria: • Documentation of the current medications with a notation that the provider reconciled the current and discharge medications. • Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications). • Documentation of the patient's current medications with a notation that the discharge medications were reviewed. • Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service. • Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review.	Current Medications Documented Performance Met: G8427: Eligible clinician attests to documenting in the medical record they obtained, updated, or reviewed the patient's current medications. OR Current Medications not Documented, Patient not Eligible Denominator Exception: G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician OR Current Medications with Name, Dosage, Frequency, or Route not Documented, Reason not Given. Performance Not Met: G8428: Current list of medications not documented as obtained, updated, or reviewed by the eligible professional, reason not given. Definitions include: Current Medications – Medications the patient is presently taking including all prescriptions, over-the-counters, herbals and vitamin/mineral/dietary (nutritional) supplements with each medication's name, dosage, frequency and administered route. Route – Documentation of the way the medication enters the body (some examples include but are not limited to: oral, sublingual, subcutaneous injections, and/or topical). Within the 2019 performance period eMeasure (v8), the numerator is defined as: "Medications Documented During Qualifying Encounter": "Qualifying Encounters During Measurement Period" QualifyingEncounterDuringMeasurementPeriod with ["Procedure, Performed": "Documentation of current medications (procedure)"] MedicationsDocumented such that MedicationsDocumented.relevantPeriod during QualifyingEncounterDuringMeasurementPeriod.relevantPeriod SNOMED-CT code (428191000124101) is used to capture the numerator.

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge. • Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days). • Notation that no medications were prescribed or ordered upon discharge. Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required. Administrative Reporting Method Details: See value sets provided for administrative codes meeting measure numerator intent.	
Denominator Statement	All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.	Denominator statement for the 2018 claims and registry specifications is as follows: "All visits for patients aged 18 years and older." Denominator statement for the 2019 performance period eMeasure (v8) is "Equals Initial Population". Initial Population is defined as: "All visits occurring during the 12 month measurement period for patients aged 18 years and older."
Denominator Details	To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the discharge date for the stay. The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or	For the purposes of defining the denominator in both the claims and registry and eMeasure versions, the denominator is defined by the patient's age (based on patient's date of birth), encounter date, denominator CPT or HCPCS codes. 2018 claims and registry specifications: Denominator Criteria (Eligible Cases): Patients aged >= 18 years on date of encounter AND Patient encounter during the reporting period (CPT or HCPCS): 59400, 59510, 59610, 59618, 90791, 90792, 90832, 90834, 90837, 90839, 92002, 92004, 92012, 92014, 92507, 92508, 92526, 92537, 92538, 92540, 92541, 92542, 92544, 92545, 92547, 92548, 92550, 92557, 92567, 92568, 92570, 92585, 92588, 92626, 96116, 96150, 96151, 96152,

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	between January 1 and December 1 of the measurement year. If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the admission date for the stay (the admission date must occur during the 31-day period). 3. Identify the discharge date for the stay (the discharge date is the event date). Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year. If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. To identify nonacute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).	97127*, 97161, 97162, 97163, 97164, 97165, 97166, 97167, 97168, 97802, 97803, 97804, 98960, 98961, 98962, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99221, 99222, 99223, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99281, 99282, 99283, 99284, 99285, 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, G0101, G0108, G0270, G0402, G0438, G0439 [*Signifies that this CPT Category I code is a non-covered service under the PFS (Physician Fee Schedule). These non-covered services will not be counted in the denominator population for claims-based measures.] Within the 2019 performance period eMeasure (v8), the denominator is defined as the initial population where: "Qualifying Encounters During Measurement Period" QualifyingEncounter where "Patient Age 18 or Older at Start of Measurement Period" The eMeasure denominator includes the above CPT and HCPCS codes as well as SNOMED-CT codes in the Medications Encounter Code Set Grouping Value set OID: 2.16.840.1.113883.3.600.1.1834.

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. Additional guidance for identifying appropriate discharges for inclusion in the eligible population: - If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date. Additional guidance for identifying the eligible population: Patients in hospice are removed from the eligible population.	
Exclusions	No exclusions.	Denominator exception for the 2018 claims and registry specifications is as follows: A patient is not eligible if the following reason is documented: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status on the date of the encounter Denominator exception for the 2019 performance period eMeasure (v8) is as follows: Medical Reason: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
Exclusion Details	N/A	2018 claims and registry specifications: Current Medications not Documented, Patient not Eligible Denominator Exception G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician. Within the 2019 performance period eMeasure (v8), the denominator exception is defined as: "Qualifying Encounters During Measurement Period" EncounterDuringMeasurementPeriod with "Medications Not Documented for Medical Reason" MedicationsNotDocumented such that MedicationsNotDocumented.authorDatetime during EncounterDuringMeasurementPeriod.relevantPeriod The eMeasure denominator exception includes codes in the value set Medical or Other reason not done SNOMED-CT Value Set OID 2.16.840.1.113883.3.600.1.1502 to capture the denominator exception.
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	N/A	This measure is not stratified.
Type Score	Rate/proportion better quality = higher score	Rate/proportion better quality = higher score
Algorithm	Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year. Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.	For both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8), the performance calculation is as follows: PERFORMANCE CALCULATION To calculate provider performance, complete a fraction with the following measure components: Numerator (A), Denominator (D), and Denominator Exceptions (C) Numerator (A): Number of visits meeting numerator criteria Denominator (D): Number of visits meeting criteria for denominator inclusion Denominator Exceptions (C): Number of visits not meeting numerator criteria with valid exceptions The method of performance calculation is determined by the following:

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented. Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.	1) identify the visits that meet the eligibility criteria for the denominator (D) which includes patients who are 18 years and older with appropriate encounters as defined by encounter codes or encounter value set during the reporting period. 2) identify which visits meet the numerator criteria (A) 3) for those visits who do not meet the numerator criteria, determine whether an appropriate exception applies (C) and subtract those visits from the denominator with the following calculation: Numerator (A)/[Denominator (D)– Denominator Exceptions (C)]
Submission items	5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record 0553 : Care for Older Adults (COA) – Medication Review 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 3317 : Medication Reconciliation on Admission 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details. 5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+.	5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge 0553 : Care for Older Adults (COA) – Medication Review 0554 : Medication Reconciliation Post-Discharge (MRP) 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: NQF 0553 is the most similar conceptually to NQF 0419. NQF 0553 is a process measure that focuses solely on the elderly population (namely, those 66 years and older) and requires evidence of at least one medication review during the entire measurement year. Our measure (NQF 0419) encompasses a larger population (all adults 18 years of age and older) and requires a medication review at every encounter. Unlike NQF 0419, there is no e Measure available for NQF 0553. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0554 is a process measure focused on the elderly population (namely, those 66 years and older) that requires medication reconciliation within 30 days for patients discharged from the hospital. NQF 0419 is different from this measure in the following ways: (1) the population focus for NQF 0419 is inclusive of all patients 18 years and older, not just those 66 years and older discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0554 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	Related Measures: Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure. Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097. Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This	frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0097 is a process measure that reflects follow-up care following discharge from an inpatient setting for patients aged 18 years and older (performance is stratified into two age groups: patients 18-65 and patients 65 and older) who are discharged from any inpatient facility. This measure requires that medication reconciliation be conducted if the patient is seen within 30 days of discharge following an inpatient hospitalization. NQF 0097 is only reported if a patient receives follow-up care within 30 days following discharge from any inpatient setting. NQF 0419 is different from this measure in the following ways: (1) the population of focus for NQF 0419 is inclusive of all patients 18 years and older, not just those discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0419 is appropriate for reporting by any EP and must be reported for every eligible encounter. Lastly, NQF 0097 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. 5b.1 If competing, why superior or rationale for additive value: N/A

Measure	0097: Medication Reconciliation Post-Discharge	0419e: Documentation of Current Medications in the Medical Record
	measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing. Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing. Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.	

Comparison of NQF 0097 and NQF 0553

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
Steward	National Committee for Quality Assurance	National Committee for Quality Assurance
Description	The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).	Percentage of adults 65 years and older who had a medication review during the measurement year. A medication review is a review of all a patient's medications, including prescription medications, over-the-counter (OTC) medications and herbal or supplemental therapies by a prescribing practitioner or clinical pharmacist.
Type	Process	Process
Data Source	Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system. No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx	Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from health plans via NCQA's online data submission system. No data collection instrument provided Attachment 0553_COA_Med_Review_Value_Sets.xlsx
Level	Health Plan	Health Plan
Setting	Outpatient Services	Outpatient Services
Numerator Statement	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).	At least one medication review conducted by a prescribing practitioner or clinical pharmacist during the measurement year and the presence of a medication list in the medical record.
Numerator Details	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication	This measure can be met using the administrative specification (using administrative claims codes) or the hybrid specification (using administrative claims codes and medical record review). Administrative: Either of the following meet criteria:

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record. This measure is specified for medical record or administrative data collection. Medical Record Reporting Details: Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria: • Documentation of the current medications with a notation that the provider reconciled the current and discharge medications. • Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications). • Documentation of the patient's current medications with a notation that the discharge medications were reviewed. • Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service. • Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates	• Both of the following during the same visit during the measurement year where the provider type is a prescribing practitioner or clinical pharmacist: ○ At least one medication review (Medication Review Value Set). ○ The presence of a medication list in the medical record (Medication List Value Set). • Transitional care management services (Transitional Care Management Services Value Set). Exclude services provided in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set). (See corresponding Excel document for the value sets referenced above.) Hybrid: Documentation must come from the same medical record and must include one of the following: • A medication list in the medical record, and evidence of a medication review by a prescribing practitioner or clinical pharmacist and the date when it was performed. • Notation that the member is not taking any medication and the date when it was noted. A review of side effects for a single medication at the time of prescription alone is not sufficient. An outpatient visit is not required to meet criteria. Do not include medication lists or medication reviews performed in an acute inpatient setting. Prescribing practitioner is defined as a practitioner with prescribing privileges, including nurse practitioners, physician assistants and other non-MDs who have the authority to prescribe medications.

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	the provider was aware of the patient's hospitalization or discharge. • Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days). • Notation that no medications were prescribed or ordered upon discharge. Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required. Administrative Reporting Method Details: See value sets provided for administrative codes meeting measure numerator intent.	
Denominator Statement	All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.	All patients 66 years and older as of the end (e.g., December 31) of the measurement year.
Denominator Details	To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the discharge date for the stay. The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year. If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient	Use administrative data to identify all patients 66 years and older as of the end of the measurement year.

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the admission date for the stay (the admission date must occur during the 31-day period). 3. Identify the discharge date for the stay (the discharge date is the event date). Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year. If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. To identify nonacute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay.	

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	Additional guidance for identifying appropriate discharges for inclusion in the eligible population: - If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date. Additional guidance for identifying the eligible population: Patients in hospice are removed from the eligible population.	
Exclusions	No exclusions.	Exclude members who use hospice services.
Exclusion Details	N/A	Exclude members who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began. These members may be identified using various methods, which may include but are not limited to enrollment data, medical record or claims/encounter data (Hospice Value Set).
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	N/A	N/A
Type Score	Rate/proportion better quality = higher score	Rate/proportion better quality = higher score
Algorithm	Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted	Step 1. Determine the eligible population: All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year. Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year. Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented. Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.	Step 2: Identify the denominator: Exclude any patients who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began. The remainder is the eligible population Step 3: Identify the numerator: Individuals in the denominator who have documentation of at least one medication review conducted by a prescribing practitioner or clinical pharmacist and have a medication list in their medical record. Step 4: Calculate the rate: Numerator/Denominator
Submission items	5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record 0553 : Care for Older Adults (COA) – Medication Review 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 3317 : Medication Reconciliation on Admission 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.	5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge 0419 : Documentation of Current Medications in the Medical Record 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient 3317 : Medication Reconciliation on Admission 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: See response in 5b.1 (response would not fit in this text box). 5b.1 If competing, why superior or rationale for additive value: ANSWER TO 5A.1: NCQA is committed to harmonization across measures and reducing unnecessary burden in measurement. However, it is important to note that the numerator (the

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+. Related Measures: Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure. Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.	specific health care service) being reported in this measure (Measure 0553) differs from many of the other related measures. Measures 0097, 2456, 3317, and 2988 address MEDICATION RECONCILIATION, which is a care service that includes compiling a list of medications the patient is currently taking and comparing it against a second list (generally a physician's admission, transfer, and/or discharge orders) in order to reconcile discrepancies between the two lists and make sure the patient is prescribed the appropriate medications and to decrease the likelihood of adverse medication interactions. This care service is different from a MEDICATION REVIEW, which is the focus of this submission (Measure 0553). In a medication review, the goal is a critical examination of all the medications a patient is taking with the objective of reaching an agreement with the patient about treatment, optimizing the impact of medicine, and minimizing medication-related problems. A medication review is also different from a simple documentation of current medications in the medical record (the focus of Measure 0419e), because this measure involves a review of medications in addition to a documentation of the patient's medications in the medical record. Additional differences among the measures include level of accountability and target population, as demonstrated below: 0053: Care for Older Adults – Medication Review Level of accountability: Health plan Target population: Older adults (age 65 years and older) 0097: Medication Reconciliation Post Discharge Level of accountability: Health plan Target population: Adults 18+ discharged from hospital 0419e: Documentation of Current Medications in the Medical Record Level of accountability: Individual clinician Target population: Adults 18+ 2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient Level of accountability: Facility (hospital) Target population: Adults 18+ discharged from hospital 3317: Medication Reconciliation on Admission Level of accountability: Facility (hospital) Target population: Adults 18+ admitted to hospital

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing. Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing. Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities Level of accountability: Facility (dialysis facility) Target population: Adults permanently assigned to a dialysis facility Evidence of performance gap and relation to risk of adverse events: • Many medication errors occur during times of transition, when patients receive medications from different prescribers who lack access to patients' comprehensive medication list. Conducting medication reconciliation at major care transitions (eg, upon admission, upon discharge) may improve patients' ability to manage their medication regimen properly and reduce the number of medication errors (Measures #0097, 2456, 3317, 2988). • Older adults are a vulnerable population and are more likely to have multiple comorbid conditions and thus be receiving multiple medications. This places them at higher risk of an adverse medication event, even without a care transition. This supports an annual medication review targeted specifically to older adults (Measure #0053). This measure is more specifically targeted to a vulnerable population and less burdensome to providers than a medication list documented at every medical visit (Measure #0419e). ---------- ANSWER TO 5b.1: While the other measures generally address a similar focus (medications), no other NQF-endorsed measures address both the same measure focus AND the same target population.

Measure	0097: Medication Reconciliation Post-Discharge	0553: Care for Older Adults (COA) – Medication Review
	medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.	

Comparison of NQF 0097 and NQF 2456

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
Steward	National Committee for Quality Assurance	Brigham and Women's Hospital
Description	The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).	This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period. At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.
Type	Process	Outcome
Data Source	Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and	Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment. Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	Preferred Provider Organizations via NCQA's online data submission system. No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx	
Level	Health Plan	Facility
Setting	Outpatient Services	Inpatient/Hospital
Numerator Statement	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).	For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.
Numerator Details	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record. This measure is specified for medical record or administrative data collection. Medical Record Reporting Details: Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria: • Documentation of the current medications with a notation that the provider reconciled the current and discharge medications. • Documentation of the current medications with a notation that	First, a "gold-standard" preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care. The resulting preadmission medication list is then compared with the medical team's documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy: 1. History discrepancies: the order is incorrect because the medical team's preadmission medication list is incorrect (e.g., the team did not know the

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications). • Documentation of the patient's current medications with a notation that the discharge medications were reviewed. • Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service. • Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge. • Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days). • Notation that no medications were prescribed or ordered upon discharge. Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required. Administrative Reporting Method Details:	patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission) 2. Reconciliation discrepancies: the medical team's preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error. The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge. See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	See value sets provided for administrative codes meeting measure numerator intent.	
Denominator Statement	All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.	The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday. So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be 75/150 = 0.5 discrepancies per medication per patient for that hospital for that month.
Denominator Details	To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the discharge date for the stay. The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year. If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the admission date for the stay (the admission date must occur during the 31-day period).	Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	3. Identify the discharge date for the stay (the discharge date is the event date). Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year. If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. To identify nonacute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. Additional guidance for identifying appropriate discharges for inclusion in the eligible population: - If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but	

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date. Additional guidance for identifying the eligible population: Patients in hospice are removed from the eligible population.	
Exclusions	No exclusions.	Patients that are discharged or expire before a gold standard medication list can be obtained.
Exclusion Details	N/A	Please see exclusion listed above.
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	N/A	Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.
Type Score	Rate/proportion better quality = higher score	Continuous variable, e.g. average better quality = lower score
Algorithm	Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year. Step 2: Determine number of patients meeting the denominator criteria as specified in section	See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation)

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year. Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented. Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.	
Submission items	5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record 0553 : Care for Older Adults (COA) – Medication Review 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 3317 : Medication Reconciliation on Admission 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details. 5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a	5.1 Identified measures: 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to "check a box" documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts. 5b.1 If competing, why superior or rationale for additive value: N/A

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+. Related Measures: Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure. Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097. Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate	

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing. Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing. Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess	

Measures	0097: Medication Reconciliation Post-Discharge	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
	the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.	

Comparison of NQF 0097 and NQF 2988

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
Steward	National Committee for Quality Assurance	Kidney Care Quality Alliance (KCQA)
Description	The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).	Percentage of patient-months for which medication reconciliation* was performed and documented by an eligible professional.** * "Medication reconciliation" is defined as the process of creating the most accurate list of all home medications that the patient is taking, including name, indication, dosage, frequency, and route, by comparing the most recent medication list in the dialysis medical record to one or more external list(s) of medications obtained from a patient or caregiver (including patient-/caregiver-provided "brown bag" information), pharmacotherapy information network (e.g., Surescripts), hospital, or other provider. ** For the purposes of medication reconciliation, "eligible professional" is defined as: physician, RN, ARNP, PA, pharmacist, or pharmacy technician.
Type	Process	Process
Data Source	Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations	Electronic Health Data, Other Dialysis facility medical record; intended for use by CMS in its CROWNWeb ESRD Clinical Data Repository. No data collection instrument provided No data dictionary

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	via NCQA's online data submission system. No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx	
Level	Health Plan	Facility
Setting	Outpatient Services	Post-Acute Care
Numerator Statement	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).	Number of patient-months for which medication reconciliation was performed and documented by an eligible professional during the reporting period. The medication reconciliation MUST: • Include the name or other unique identifier of the eligible professional; AND • Include the date of the reconciliation; AND • Address ALL known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana); AND • Address for EACH home medication: Medication name(1), indication(2), dosage(2), frequency(2), route of administration(2), start and end date (if applicable)(2), discontinuation date (if applicable)(2), reason medication was stopped or discontinued (if applicable)(2), and identification of individual who authorized stoppage or discontinuation of medication (if applicable)(2); AND • List any allergies, intolerances, or adverse drug events experienced by the patient. _____ 1. For patients in a clinical trial, it is acknowledged that it may be unknown as to whether the patient is receiving the therapeutic agent or a placebo. 2. "Unknown" is an acceptable response for this field.
Numerator Details	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record	NUMERATOR STEP 1. For each patient meeting the denominator criteria in the given calculation month, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month: A. Facility attestation that during the calculation month:

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record. This measure is specified for medical record or administrative data collection. Medical Record Reporting Details: Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria: • Documentation of the current medications with a notation that the provider reconciled the current and discharge medications. • Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications). • Documentation of the patient's current medications with a notation that the discharge medications were reviewed. • Documentation of a current medication list, a discharge medication list and notation that	1. The patient's most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided "brown-bag" information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled; AND 2. ALL of the following items were addressed for EACH identified medication: a) Medication name; b) Indication (or "unknown"); c) Dosage (or "unknown"); d) d)Frequency (or "unknown"); e) Route of administration (or "unknown"); f) Start date (or "unknown"); g) End date, if applicable (or "unknown"); h) Discontinuation date, if applicable (or "unknown"); i) Reason medication was stopped or discontinued, if applicable (or "unknown"); and j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or "unknown"); AND 3. Allergies, intolerances, and adverse drug events were addressed and documented. B. Date of the medication reconciliation. C. Identity of eligible professional performing the medication reconciliation. NUMERATOR STEP 2. Repeat "Numerator Step 1" for each month of the one-year reporting period to define the final numerator (patient-months).

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	both lists were reviewed on the same date of service. • Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge. • Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days). • Notation that no medications were prescribed or ordered upon discharge. Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required. Administrative Reporting Method Details: See value sets provided for administrative codes meeting measure numerator intent.	

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
Denominator Statement	All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.	Total number of patient-months for all patients permanently assigned to a dialysis facility during the reporting period.
Denominator Details	To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the discharge date for the stay. The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year. If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the admission date for the stay (the admission date must occur during the 31-day period).	DENOMINATOR STEP 1. Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility in the given calculation month. DENOMINATOR STEP 2. For all patients included in the denominator in the given calculation month in “Denominator Step 1”, identify and remove all in-center hemodialysis patients who received < 7 dialysis treatments in the calculation month. DENOMINATOR STEP 3. Repeat “Denominator Step 1” and “Denominator Step 2” for each month of the one-year reporting period.

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	3. Identify the discharge date for the stay (the discharge date is the event date). Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year. If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. To identify nonacute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).	

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. Additional guidance for identifying appropriate discharges for inclusion in the eligible population: - If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date. Additional guidance for identifying the eligible population: Patients in hospice are removed from the eligible population.	
Exclusions	No exclusions.	In-center patients who receive <7 hemodialysis treatments in the facility during the reporting month.
Exclusion Details	N/A	As detailed in "Denominator Step 2" above, transient patients, defined as in-center patients who receive <7 hemodialysis treatments in the facility during the reporting month, are excluded from the measure.

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	N/A	Not applicable.
Type Score	Rate/proportion better quality = higher score	Rate/proportion better quality = higher score
Algorithm	Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year. Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year. Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.	Scores are calculated using the following algorithm. For each calculation month in the one-year reporting period: 1. IDENTIFY THE “RAW DENOMINATOR POPULATION” Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility during the given calculation month. 2. REMOVE PATIENTS MEETING MEASURE EXCLUSION CRITERIA TO DEFINE THE “FINAL DENOMINATOR POPULATION” FOR THE CALCULATION MONTH For all patients included in the denominator during the given calculation month in Step 1 above, identify and remove all in-center patients who received < 7 hemodialysis treatments during the given calculation month. 3. IDENTIFY THE “NUMERATOR POPULATION” FOR THE CALCULATION MONTH For each patient remaining in the denominator during the given calculation month after Step 2, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month: A. Facility attestation that during the calculation month: 1. The patient’s most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided “brown-bag” information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled; AND 2. ALL of the following items were addressed for EACH identified medication: a) Medication name; b) Indication (or “unknown”); c) Dosage (or “unknown”); d) Frequency (or “unknown”);

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.	e) Route of administration (or "unknown"); f) Start date (or "unknown"); g) End date, if applicable (or "unknown"); h) Discontinuation date, if applicable (or "unknown"); i) Reason medication was stopped or discontinued, if applicable (or "unknown"); and j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or "unknown"); AND 3. Allergies, intolerances, and adverse drug events were addressed and documented. B. Date of medication reconciliation. C. Identity of eligible professional performing medication reconciliation. 4. CALCULATE THE PERFORMANCE SCORE FOR THE CALCULATION MONTH Calculate the facility's performance score for the given calculation month as follows: Month's Performance Score = Month's Final Numerator Population ÷ Month's Final Denominator Population 5. CALCULATE THE ANNUAL PERFORMANCE SCORE Calculate the facility's annual performance score as follows: Facility's Annual Performance Score = (Facility's Month 1 Score + Month 2 Score +..... + Month 12 Score) ÷ 12
Submission items	5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record 0553 : Care for Older Adults (COA) – Medication Review 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 3317 : Medication Reconciliation on Admission	5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge 0554 : Medication Reconciliation Post-Discharge (MRP) 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities is harmonized with existing NQF-endorsed medication reconciliation measures in that all similarly specify that the medication reconciliation must address ALL prescriptions, over-the-counters,herbals,vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency, and route. The KCQA measure, however, is unique among the currently endorsed medication reconciliation measures in that the level of analysis is the dialysis facility. The KCQA measure also moves beyond a single "check/box", specifying multiple components that must be met to be counted as a

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details. 5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+. Related Measures: Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure. Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in	"success." It requires the following additional information on each medication, where applicable and known: indication, start and end date, discontinuation date, reason the medication was stopped or discontinued, and identification of the individual who authorized stoppage or discontinuation of the medication. Additionally, given the increasing frequency with which medical marijuana is prescribed, the KCQA measure specifies that this pharmacotherapeutic agent must be addressed during the reconciliation. KCQA believes these additional foci are necessary to ensure the medication reconciliation process is as comprehensive as possible to better identify and effectively address potential sources of adverse drug-related events and not function merely as a single "check-box" measure. Testing demonstrated these data elements are effectively captured and recorded in facility's electronic medical record systems during the routine medication reconciliation process. 5b.1 If competing, why superior or rationale for additive value: Not applicable; this medication management measure is unique in its specific focus on the ESRD population.

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097. Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and	

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	measure focus and is therefore not competing. Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing. Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home	

Measures	0097: Medication Reconciliation Post-Discharge	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
	medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.	

Comparison of NQF 0097 and NQF 3317

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
Steward	National Committee for Quality Assurance	Centers for Medicare & Medicaid Services
Description	The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).	Percentage of patients for whom a designated PTA medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization.
Type	Process	Process
Data Source	Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system. No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx	Electronic Health Records, Paper Medical Records The data dictionary and measure information form that provide instructions for abstracting the data for the measure are included with this application as an attachment. A structured chart abstraction tool with operational data definitions was developed in Microsoft Access for field testing. Prior to implementation, the measure developer will provide a finalized abstraction tool. Available in attached appendix at A.1 No data dictionary
Level	Health Plan	Facility
Setting	Outpatient Services	Inpatient/Hospital

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
Numerator Statement	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).	Number of patients for whom a designated Prior to Admission (PTA) medication list was generated by referencing one or more external sources of medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization when the admission date is Day 0.
Numerator Details	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record. This measure is specified for medical record or administrative data collection. Medical Record Reporting Details: Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria: • Documentation of the current medications with a notation that the provider reconciled the current and discharge medications. • Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).	The numerator is operationalized into three key criteria of the medication reconciliation process that must be met: 1. Medications taken by the patient prior to admission are documented on a designated PTA medication list. 2. The PTA medication list is generated using at least one external source to identify the medications taken by the patient prior to admission. 3. All medications listed on the PTA medication list have a reconciliation action to continue, discontinue, or modify by the end of Day 2 of the hospitalization, or if there are no medications on the PTA medication list, the prescriber has signed the document by the end of Day 2 of the hospitalization to indicate his/her review of the PTA medication list. The first criterion requires that the medical record contain a designated PTA Medication List to document medications that the patient is taking prior to admission. Documenting PTA medications in a designated location eliminates the potential for duplicative or inconsistent documentation of medication histories, avoids the potential for omitted medications, and provides a master source of PTA medication for easy reference by providers. PTA medications may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This criterion aligns with one of the five elements of The Joint Commission's National Patient Safety Goal (NPSG.03.06.01) on medication reconciliation (The Joint Commission, 2016). The second criterion requires that facilities consult at least one source external to the facility's records to increase comprehensive capture of all active medications on the PTA medication list. Incomplete or inaccurate PTA medication lists may result in inadequate medication reconciliation actions by the prescriber, which may lead to medication errors and ADEs. Given the absence of a single, accurate source of information on PTA medications (gold standard), the measure establishes a minimum standard for compiling PTA medication information rather than being prescriptive regarding which sources should be referenced. This requirement also aligns with other existing NQF-endorsed measures that focus on medication reconciliation. The measure allows for a wide-range of external sources to account for situations where the routinely consulted source fails to generate the information needed. For example, the patient may not be able or willing to provide

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
	• Documentation of the patient's current medications with a notation that the discharge medications were reviewed. • Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service. • Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge. • Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days). • Notation that no medications were prescribed or ordered upon discharge. Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required. Administrative Reporting Method Details: See value sets provided for administrative codes meeting measure numerator intent.	information on PTA medications or a retail pharmacy may be closed or not willing to disclose PTA medications without obtaining prior patient consent. Therefore, to meet the External Source requirement, the facility can reference one or more of the following sources to compile the PTA medication list: • Interview of the patient or patient proxy such as a caregiver • Medication container brought in by patient or patient proxy • Medication list brought by patient or patient proxy • Patient support network, such as a group home • Nursing home • Outpatient prescriber or emergency department • Retail pharmacy • Prescription Drug Monitoring Program (PDMP) • Electronic prescribing network system (e.g., Allscripts®, Surescripts®) or aggregate pharmacy billing records (such as, claims data using state/federal healthcare plans) The third and final criterion requires that a licensed prescriber reconciles each medication on the PTA Medication List by the end of Day 2 of the hospitalization and documents whether the medication should be continued, discontinued, or modified. The date of admission is considered Day 0 and subsequent days are considered Day 1 and Day 2 for this measure. If there are no medications on the PTA medication list, the prescriber must sign the document by the end of Day 2 of the hospitalization to indicate his or her review of the PTA medication list for consideration in future treatment decisions. For example, information that indicates the patient is not taking any medications may be important to communicate to the treatment team because there may be a need to initiate treatment of indications that are discovered during admission. Signing the PTA medication list by the end of Day 2 of the hospitalization for patient admissions with no PTA medications also helps to improve communication between members of the care team and other providers during care transitions. To simplify chart abstraction and prevent abstractors from having to distinguish between medications, herbal supplements, and other remedies a patient might take, all entries on the PTA medication list must be reconciled to meet the requirements of the third criterion. For additional details on each of the data elements included in the measure construct, refer to Appendix A.1, which includes the Data Dictionary and Data Collection Tool. Citations *The Joint Commission. (2016). National patient safety goals effective January 1, 2017: Hospital Accreditation Program. Retrieved from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_HAP_Jan2017.pdf

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
Denominator Statement	All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.	All patients admitted to an inpatient facility from home or a non-acute setting.
Denominator Details	To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the discharge date for the stay. The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year. If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the admission date for the stay (the admission date must occur during the 31-day period). 3. Identify the discharge date for the stay (the discharge date is the event date). Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year. If the admission date and the discharge date for an acute inpatient stay occur between	All adult and pediatric patients admitted to an IPF are eligible to be sampled, regardless of insurance types.

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
	the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. To identify nonacute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set). 3. Identify the admission date for the stay. 4. Identify the discharge date for the stay. Additional guidance for identifying appropriate discharges for inclusion in the eligible population: - If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through	

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
	December 1, disregard the readmission or direct transfer and use the initial discharge date. Additional guidance for identifying the eligible population: Patients in hospice are removed from the eligible population.	
Exclusions	No exclusions.	The measure applies two exclusion criteria to ensure that it is feasible to complete the medication reconciliation process on admission to the IPF: 1. Patients transferred from an acute care setting 2. Patient admissions with a length of stay less than or equal to 2 days
Exclusion Details	N/A	Transfer from an Acute Care Setting: The first exclusion criterion applies to patient admissions that result from a transfer from an acute care setting, such as another inpatient facility or inpatient unit. This exclusion is applied because medication reconciliation with outpatient medications may have been done at the transferring facility and different medication reconciliation processes are required at the receiving IPF for those admissions to focus on the regimen that was used in the transferring facility. Patient admissions from long-term care facilities and emergency departments are not considered transfers and are included in the denominator for the measure. Length of Stay Less than or Equal to 2 Days: The second exclusion criterion applies to patient admissions with lengths of stay shorter than the time needed to adequately complete the medication reconciliation process. The timeframe from admission needed to complete the medication reconciliation process was discussed with the TEP, which recommended a requirement to complete reconciliation by the end of Day 2 if the day of admission is Day 0. They cited instances where patients are admitted on weekends and outpatient providers are not available to ascertain PTA medications or where patients are not stable enough to provide information immediately upon admission. The measure developer also evaluated this timeframe empirically using the field testing data to determine when most facilities could complete the medication reconciliation process. Table 2b2.2 in the NQF Measure Testing Form contains all records with complete medication reconciliation for all medications on the PTA medication list and shows the percentage of those records that had completed the medication reconciliation in one day increments of time from admission. This analysis confirmed the appropriateness of the 2-day timeframe for completing the medication reconciliation process.

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	N/A	Not applicable because this measure is not stratified.
Type Score	Rate/proportion better quality = higher score	Rate/proportion better quality = higher score

Algorithm	Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.
	Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.
	Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.
	Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.
		To calculate the performance score:
		1. Start processing. Run cases that are included in the Initial Patient Population as follows:
		  a. Find the patients that the performance measure is designed to address (all adult and pediatric patients admitted to the inpatient facility from home or a non-acute setting with a length of stay greater than two days).
		2. Check Length of Stay (calculated as the Discharge Date minus the Admission Date).
		  a. If the Length of Stay is greater 2 days, continue processing and proceed to Transfer From an Acute Care Setting.
		  b. If the Length of Stay is less than or equal to 2 days, the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
		3. Check Transfer From an Acute Care Setting.
		  a. If the Transfer From an Acute Care Setting is equal to 1 (Yes), the case was admitted from a transfer from an acute care setting and the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
		  b. If the Transfer From an Acute Care Setting is equal to 2 (No), the case was admitted from an admission source other than an acute case setting. Continue processing and proceed to Designated PTA Medication List.
		4. Check Designated PTA Medication List.
		  a. If the Designated PTA Medication List is equal to 1 (Yes), continue processing and proceed to External Source.
		  b. If the Designated PTA Medication List is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
		5. Check External Source.
		  a. If External Source is equal to 1 (Yes), continue processing and proceed to Reconciliation Action.

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
		b. If External Source is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing. 6. Check Reconciliation Action. a. If Reconciliation Action is equal to 1 (Yes) or 3 (N/A), continue processing and proceed to Reconciliation Action by End of Day 2. b. If Reconciliation Action is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing. 7. Check Reconciliation Action by the end of Day 2 when the Admission date is Day 0. a. If Reconciliation Action by End of Day 2 is equal to 1 (Yes), the record will proceed to Measure Category Assignment of E and will be in the Numerator Population. Stop processing. b. If Reconciliation Action by End of Day 2 is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
Submission items	5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record 0553 : Care for Older Adults (COA) – Medication Review 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 3317 : Medication Reconciliation on Admission 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details. 5b.1 If competing, why superior or rationale for additive value: This measure assesses	5.1 Identified measures: 0293 : Medication Information 0097 : Medication Reconciliation Post-Discharge 0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care) 0553 : Care for Older Adults (COA) – Medication Review 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: The Measure Developer evaluated existing measures in the NQF portfolio to determine whether the Medication Reconciliation on Admission measure would compete with existing measures. Among the five NQF-endorsed measures that evaluate the medication reconciliation process, three (NQF #0097, #0553, #2988) are specified for the outpatient setting and the two (NQF #0293 and #0646) that are specified for the inpatient setting focus on communication of information at discharge. Therefore, the Medication Reconciliation on Admission measure is the only measure that evaluates medication reconciliation on admission to an inpatient facility. To align definitions with other measures that establish a designated timeframe by which a given process must be completed from admission, the Measure Developer harmonized the Medication Reconciliation on Admission measure timeframes with the timeframe specifications of SUB-1 Alcohol Use Screening (NQF 1661)

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
	medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+. Related Measures: Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure. Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge.	and TOB-1 Tobacco Use Screening (NQF 1651), developed by The Joint Commission. Both measures define the length of stay in calendar days. Standardizing definitions for calculating length of stay using the admission and discharge dates without factoring-in the admission and discharge times will not only help reduce confusion across measures but also help to improve the reliability of the measure scores by eliminating the need to capture times, which were found to be unreliable during field testing. To develop the three data elements associated with the medication reconciliation process, the Measure Developer compared the conceptual descriptions and definitions of five NQF-endorsed measures (NQF 0553, NQF 2988, NQF 0293, NQF 0646, and NQF 0097) that evaluate the medication reconciliation process. Four of the five measures explicitly require a designated medication list. For this measure, the Measure Developer operationalized that requirement with the Designated PTA Medication List data element. Of the three measures that required collection of medications, two had requirements for the types of sources that should be referenced to compile the list. For the Medication Reconciliation on Admission measure, the Measure Developer set to establish a minimum standard and aligned with the approach to require "one or more external sources." While several measures required the type of information to be collected on each medication, the Measure Developer decided not to include those data elements in this measure given the high performance and low variation for those data elements in testing. Each of the measures defines the process of reconciling the medications on the list differently. The Measure Developer incorporated aspects of each definition that are most applicable to the IPF setting. For example, the Measure Developer aligned with measures that require that the reconciliation be completed by a prescriber and that there be documentation of whether each medication be continued, modified, or discontinued. Finally, the Measure Developer considered different approaches to scoring the measure. Four of the five NQF-endorsed measures require that all aspects of the medication reconciliation process be completed for a patient to pass the measure. The fifth measure evaluates the number of patient months for which the medication reconciliations were completed, however, this is only applicable in the outpatient setting. Therefore, the Measure Developer aligned the scoring approach to produce measure scores that represent the percentage of patient admissions that meet all the medication reconciliation criteria. 5b.1 If competing, why superior or rationale for additive value: This measure complements other existing measures because it focuses on the completion of the medication reconciliation process by the end of Day 2 of the hospitalization to the facility, which is not addressed by any existing measure. Medication reconciliation on admission is important to inform accurate medication reconciliation at discharge, which is evaluated by two of the existing measures. Medication reconciliation on admission also ensures that efforts to

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
	Therefore the measure focus is different from measure 0097. Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing. Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an	reconcile medications in the outpatient setting are continued at the transition to the inpatient setting.

Measures	0097: Medication Reconciliation Post-Discharge	3317: Medication Reconciliation on Admission
	admission and assesses adult and pediatric patients it is not competing. Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.	

Comparison of NQF 0468 and NQF 0231

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
Steward	Centers for Medicare & Medicaid Services	Agency for Healthcare Research and Quality
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as	In-hospital deaths per 1,000 hospital discharges with pneumonia as a principal diagnosis for patients ages 18 years and older. Excludes obstetric discharges and transfers to another hospital. [NOTE: The software provides the rate per hospital discharge. However, common practice reports the measure as per 1,000 discharges. The user must multiply the rate obtained from the

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.	software by 1,000 to report in-hospital deaths per 1,000 hospital discharges.]
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference:	Claims HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. URL Attachment IQI_Regression_Coefficients-_Code_Tables_and_Value_Sets.xlsx

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS	Discharges, for patients ages 18 years and older, with a principal ICD-9-CM diagnosis code for pneumonia.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	ICD-9-CM Pneumonia diagnosis codes: 00322 SALMONELLA PNEUMONIA 0212 PULMONARY TULAREMIA 0391 PULMONARY ACTINOMYCOSIS 0521 VARICELLA PNEUMONITIS 0551 POSTMEASLES PNEUMONIA 0730 ORNITHOSIS PNEUMONIA 1124 CANDIDIASIS OF LUNG 1140 PRIMARY COCCIDIOIDOMYCOS 1144 CHRONIC PULMON COCCIDIOIDOMYCOSIS 1145 UNSPEC PULMON COCCIDIOIDOMYCOSIS 11505 HISTOPLASM CAPS PNEUMON 11515 HISTOPLASM DUB PNEUMONIA 11595 HISTOPLASMOSIS PNEUMONIA 1304 TOXOPLASMA PNEUMONITIS 1363 PNEUMOCYSTOSIS 4800 ADENOVIRAL PNEUMONIA 4801 RESP SYNCYT VIRAL PNEUM 4802 PARINFLUENZA VIRAL PNEUM 4803 PNEUMONIA DUE TO SARS 4808 VIRAL PNEUMONIA NEC 4809 VIRAL PNEUMONIA NOS 481 PNEUMOCOCCAL PNEUMONIA 4820 K. PNEUMONIAE PNEUMONIA 4821 PSEUDOMONAL PNEUMONIA 4822 H.INFLUENZAE PNEUMONIA 48230 STREP PNEUMONIA UNSPEC 48231 GRP A STREP PNEUMONIA 48232 GRP B STREP PNEUMONIA 48239 OTH STREP PNEUMONIA

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
		4824 STAPHYLOCOCCAL PNEUMONIA 48240 STAPH PNEUMONIA UNSP 48241 METH SUS PNEUM D/T STAPH 48242 METH RES PNEU D/T STAPH 48249 STAPH PNEUMON OTH 48281 ANAEROBIC PNEUMONIA 48282 E COLI PNEUMONIA 48283 OTH GRAM NEG PNEUMONIA 48284 LEGIONNAIRES DX 48289 BACT PNEUMONIA NEC 4829 BACTERIAL PNEUMONIA NOS 4830 MYCOPLASMA PNEUMONIA 4831 CHLAMYDIA PNEUMONIA 4838 OTH SPEC ORG PNEUMONIA 4841 PNEUM W CYTOMEG INCL DIS 4843 PNEUMONIA IN WHOOP COUGH 4845 PNEUMONIA IN ANTHRAX 4846 PNEUM IN ASPERGILLOSIS 4847 PNEUM IN OTH SYS MYCOSES 4848 PNEUM IN INFECT DIS NEC 485 BRONCOPNEUMONIA ORG NOS 486 PNEUMONIA, ORGANISM NOS 4870 INFLUENZA WITH PNEUMONIA 48801 INFLUENZA D/T IDENTIFIED AVIAN INFLUENZA VIRUS 48811 INFLUENZA D/T IDENTIFIED 2009 H1N1 INFLUENZA VIRUS W/PNEUMONIA 48881 NOVEL INFLUENZA W/PNEUMONIA
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;	Exclude cases: • transferring to another short-term hospital (DISP=2) • MDC 14 (pregnancy, childbirth, and puerperium) • with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and	Exclude cases: • transferring to another short-term hospital (DISP=2) • MDC 14 (pregnancy, childbirth, and puerperium) • with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	N/A	Not applicable
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of “predicted” to the number of “expected” deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital’s performance with its observed case mix, and the denominator is the number of deaths expected based on the nation’s performance with that hospital’s case mix. This approach is analogous to a ratio of “observed” to	The measure is expressed as a rate, defined as (outcome of interest / population at risk) or (numerator / denominator). The AHRQ Quality Indicators (AHRQ QI) software performs six steps to produce the rate 1) Discharge-level data is used to identify inpatient records containing the outcome of interest and 2) the population at risk. 3) Calculate observed rates. Using output from steps 1 and 2, observed rates are calculated for user-specified combinations of stratifiers. 4) Calculate expected rates. Use the risk-adjustment model to calculate the rate one would expect at the hospital based on the hospital´s case-mix and the average performance for that case-mix in the reference population. 5) Calculate risk-adjusted rate. Use the indirect standardization to account for case-mix. For indicators that are not risk-adjusted, the risk-adjusted rate is the same as the observed rate. 6) Calculate smoothed rate. A Univariate shrinkage estimator is applied to the risk-adjusted rates. The shrinkage estimator reflects a reliability adjustment unique to each indicator and provider. The estimator is the signal-to-noise ratio, where signal is the between provider variance and noise is the within provider variance.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	"expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 5a.1 Are specs completely harmonized? Yes

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of	5a.2 If not completely harmonized, identify difference, rationale, impact: 5b.1 If competing, why superior or rationale for additive value: AHRQ and CMS engaged in a harmonization process when both measures were submitted for endorsement. In-hospital mortality and 30-day mortality measures are complementary and provide alternative perspectives on hospital performance. In-hospital mortality measures may be calculated by the hospital in real time without the need to link to vital records or other sources of mortality data.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0231: Pneumonia Mortality Rate (IQI #20)
	complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	

Comparison of NQF 0468 and NQF 0279

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
Steward	Centers for Medicare & Medicaid Services	Agency for Healthcare Research and Quality
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.	Discharges with a principal diagnosis of community acquired bacterial pneumonia per 100,000 population, age 18 or older. Excludes sickle cell or hemoglobin-S admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions. [NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient	Claims While the measure is tested and specified using data from the Healthcare Cost and Utilization Project (HCUP) (see section 1.1 and 1.2 of the measure testing form), the measure specifications and

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	software are specified to be used with any ICD-9-CM- or ICD-10-CM/PCS coded administrative billing/claims/discharge dataset. Available at measure-specific web page URL identified in S.1 Attachment PQI_11_Community_Acquired__Pneumonia_Admission_Rate.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	Discharges, for patients ages 18 years and older, with a principal ICD-10-CM diagnosis code for bacterial pneumonia (ACSBACD). [NOTE: By definition, discharges with a principal diagnosis of bacterial pneumonia are precluded from an assignment of MDC 14 by grouper software. Thus, obstetric discharges should not be considered in the PQI rate, though the AHRQ QI™ software does not explicitly exclude obstetric cases.]
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	Community acquired bacterial pneumonia diagnosis codes: (ACSBACD) J13 - Pneumonia due to Streptococcus pneumoniae J14 - Pneumonia due to Hemophilus influenzae J15211 - Pneumonia due to Methicillin susceptible Staphylococcus aureus J15212 - Pneumonia due to Methicillin resistant Staphylococcus aureus J153 - Pneumonia due to streptococcus, group B J154 - Pneumonia due to other streptococci J157 - Pneumonia due to Mycoplasma pneumoniae J159 - Unspecified bacterial pneumonia J160 - Chlamydial pneumonia J168 - Pneumonia due to other specified infectious organisms J180 - Bronchopneumonia, unspecified organism J181 - Lobar pneumonia, unspecified organism J188 - Other pneumonia, unspecified organism J189 - Pneumonia, unspecified organism Sickle cell anemia or HB-S disease diagnosis codes: (ACSBA2D) D570- Hb-SS disease with crisis, unspecified D5701 - Hb-SS disease with acute chest syndrome D5702 - Hb-SS disease with splenic sequestration D571 - Sickle-cell disease without crisis D5720 - Sickle-cell/Hb-C disease without crisis D57211 - Sickle-cell/Hb-C disease with acute chest syndrome

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
		D57212 - Sickle-cell/Hb-C disease with splenic sequestration D57219 - Sickle-cell/Hb-C disease with crisis, unspecified D5740 - Sickle-cell thalassemia without crisis D57411 - Sickle-cell thalassemia with acute chest syndrome D57412 - Sickle-cell thalassemia with splenic sequestration D57419 - Sickle-cell thalassemia with crisis, unspecified D5780 - Other sickle-cell disorders without crisis D57811 - Other sickle-cell disorders with acute chest syndrome D57812 - Other sickle-cell disorders with splenic sequestration D57819 - Other sickle-cell disorders with crisis, unspecified Appendix A – Admission Codes for Transfers Appendix C – Immunocompromised State Diagnosis and Procedure Codes (See attached technical specifications, Appendix A, and Appendix C for detailed list of codes.) Exclude cases: • transfer from a hospital (different facility) (Appendix A) • transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF) (Appendix A) • transfer from another health care facility (Appendix A) • with any-listed ICD-10-CM diagnosis codes for sickle cell anemia or HB-S disease (ACSBA2D) • with any-listed ICD-10-CM diagnosis codes (Appendix C) or any-listed ICD-10-PCS procedure codes for immunocompromised state (Appendix C) • with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing)
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a	Population ages 18 years and older in metropolitan area* or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	*The term "metropolitan area" (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, "area" could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area, or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	Not applicable.
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA).	Not applicable.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and	Not applicable.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	
Risk Adjustment	Statistical risk model	No risk adjustment or risk stratification
Stratification	N/A	Not applicable.
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's	Risk adjustment is not currently included in the ICD-10-CM/PCS v2018 of the AHRQ QI specifications, due to the transition to ICD-10-CM/PCS (October 1, 2015). At least one full year of data coded in ICD-10-CM/PCS is needed in order to develop robust risk adjustment models. A full year of ICD-10-CM/PCS coded all-payer data will not be available until mid-2019. AHRQ will announce an anticipated date as soon as one is known.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	5.1 Identified measures: 5a.1 Are specs completely harmonized? 5a.2 If not completely harmonized, identify difference, rationale, impact: 5b.1 If competing, why superior or rationale for additive value:

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and	

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0279: Community Acquired Pneumonia Admission Rate (PQI 11)
	exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	

Comparison of NQF 0468 and NQF 0506

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and older discharged from the hospital with either a principal discharge diagnosis of pneumonia (including aspiration pneumonia) or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). Readmission is defined as an unplanned readmission for any cause within 30 days of the discharge date for the index admission. Readmissions are classified as planned and unplanned by applying the planned readmission algorithm. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived from the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) index score at the patient nine-digit zip code level for use in studying the association between our measure and social risk factors (SRFs). References Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNreadmission_Fall2020_final_7.22.20.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from	The outcome for this measure is 30-day readmissions. We define readmission as an inpatient acute care admission for any cause, with

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients 65 and older discharged from the hospital with a principal diagnosis of pneumonia, including aspiration pneumonia or a principal diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary diagnosis of severe sepsis. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index pneumonia admission, excluding planned readmissions as defined below. Planned Readmission Algorithm (Version 4.0) The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare claims and VA administrative data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital. The planned readmission algorithm has three fundamental principles: 1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/immunotherapy, rehabilitation); 2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and, 3. Admissions for acute illness or for complications of care are never planned. The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
		In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the pneumonia measure without modifications. The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries; 3. Aged 65 or over; 4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and,

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	5. Not transferred from another acute care facility.
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	The 30-day pneumonia (PN) readmission measure excludes index admissions for patients: 1. Discharged against medical advice (AMA); 2. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries); 3. Admitted within 30 days of a prior index admission for pneumonia.
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.	The pneumonia readmission measure excludes index admissions for patients: 1. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 2. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database. Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted. 3. Pneumonia admissions within 30 days of discharge from a qualifying pneumonia index admission are identified by comparing the discharge date from the index admission with subsequent admission dates.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	Rationale: Additional pneumonia admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	N/A	N/A
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are	The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet:	clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality. The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	(https://qualitynet.org/inpatient/measures/readmission/methodology). References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 2882 : Excess days in acute care (EDAC) after hospitalization for pneumonia 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	

Comparison of NQF 0468 and NQF 1891

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and over discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD. The outcome (readmission) is defined as unplanned readmission for any cause within 30 days of the discharge date for the index admission (the admission included in the measure cohort). A specified set of planned readmissions do not count in the readmission outcome. CMS annually reports the measure for patients who are 65 years or older and are enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual-eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated AHRQ SES index score at the patient nine-digit zip code level for use in studying the association between our measure and SRFs. References Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDreadmission_Fall2020_final_7.22.20.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	The outcome for this measure is 30-day readmission. We define readmission as an inpatient admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients discharged from the hospital with a principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index COPD admission, excluding planned readmissions as defined below. Planned Readmission Algorithm (Version 4.0) The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare and VA administrative claims data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital. The planned readmission algorithm has three fundamental principles: 1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/ immunotherapy, rehabilitation); 2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and, 3. Admissions for acute illness or for complications of care are never planned. The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures. In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the COPD measure without modifications. The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration	The cohort includes admissions for patients aged 65 or older, who have been discharged from the hospital with either a principal discharge diagnosis of COPD OR a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD and with a complete claims history for the 12 months prior to admission. Additional details are provided in S.9 Denominator Details.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of COPD with exacerbation; 2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B Medicare for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries; 3. Aged 65 or over; 4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and, 5. Not transferred to another acute care facility.
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA).	The 30-day COPD readmission measures exclude index admissions for patients: 1. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries); 2. Discharged against medical advice (AMA); and, 3. Admitted within 30 days of a prior index admission for COPD.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods	1. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database. Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted. 2. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. COPD admissions within 30 days of discharge from a qualifying COPD index admission are identified by comparing the discharge date from the index admission with subsequent admission dates. Rationale: Additional COPD admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	(June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	N/A	N/A
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It	The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of discharge from the index admission using age, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality. The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology). References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11)	5.1 Identified measures: 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to	1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2879 : Hybrid Hospital-Wide Readmission (HWR) Measure with Claims and Electronic Health Record Data 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	

Comparison of NQF 0468 and NQF 1893

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	or patients hospitalized in Veterans Health Administration (VA) facilities.	
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference:	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References:

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries 3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
Risk Adjustment	Statistical risk model	Statistical risk model

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
Stratification	N/A	N/A
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge	3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
	diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	

Comparison of NQF 0468 and NQF 2579

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
Steward	Centers for Medicare & Medicaid Services	*
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.	Inpatient/Hospital
Type	Outcome	Respiratory : Pneumonia
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS	We do not impute missing data for any of the variables included in the measure. However, if a hospitalization is missing a DRG or DRG weight, we exclude it as an index admission. Inpatient services: Inpatient facility services; Inpatient services: Evaluation and management; Inpatient services: Procedures and surgeries; Inpatient

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the	services: Imaging and diagnostic; Inpatient services: Lab services; Inpatient services: Admissions/discharges; Inpatient services: Labor (hours, FTE, etc.); Other inpatient services; Ambulatory services: Outpatient facility services; Ambulatory services: Emergency Department; Ambulatory services: Pharmacy; Ambulatory services: Evaluation and management; Ambulatory services: Procedures and surgeries; Ambulatory services: Imaging and diagnostic; Ambulatory services: Lab services; Ambulatory services: Labor (hours, FTE, etc.); Other ambulatory services; Durable Medical Equipment (DME); Other services not listed See S.7.8 for a full list of care settings included Data Sources Medicare Inpatient and Outpatient Administrative Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims. The 2020 reporting period for these analyses include Medicare administrative claims and enrollment information for patients with hospitalizations between July 1, 2016 and June 30, 2019. Medicare administrative claims for the 12 months prior to and during the index admission are used for risk adjustment. The period for public reporting of the PN payment measure aligns with the 30-day PN mortality and readmission measures for harmonization purposes. The datasets also contain price-standardized payments for Medicare patients across all Medicare settings, services, and supplies (that is, inpatient, outpatient, SNF, home health agency, hospice, physician/clinical laboratory/ambulance services, and durable medical equipment, prosthetics/orthotics, and supplies). The CMS Standardization Methodology for Allowed Amount for 2009 through 2019 was applied to the claims to calculate the measures. Price-standardized payments for Medicare patients across all Medicare settings, services, and supplies (that is, inpatient, outpatient, SNF, home health agency, hospice, physician/clinical laboratory/ambulance services, and durable medical equipment, prosthetics/orthotics, and supplies) were calculated using standardized methodology specific to services reimbursed through Medicare parts A and B (for specific values see https://www.resdac.org/articles/cms-price-payment-standardization-overview). Medicare Enrollment Database (EDB) This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This dataset was used to obtain information on enrollment, date of birth, and post-discharge mortality status. These data have previously been shown to accurately reflect patient vital status (Fleming et al. 1992).

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	Medicare Fee Schedules Fee schedules are lists of pre-determined reimbursement amounts for certain services and supplies (e.g. physician services, independent clinical labs, ambulance services, durable medical equipment) and are used by Medicare in the calculation of payment to providers. We used the applicable fee schedules when calculating payments for claims that occurred in each care setting. Federal Register Final Rules for Medicare Prospective Payment Systems and Payment Policies Certain data necessary to calculate payments (e.g. annual base payments and conversion factors, DRG weights, wage indexes, and average length of stay) were taken from applicable Federal Register Final Rules. CMS-published Wage Index Data Wage index data not published in Federal Register Final Rules (such as the wage index data for Renal Dialysis Facilities) were obtained through the CMS website. American Community Survey (2013-2017) We used the American Community Survey (2013-2017) to derive an updated Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) index score at the patient nine-digit zip code level for use in studying the association between our measure and social risk factors (SRFs). Reference Fleming, C., Fisher, E., Chang, C., Bubolz, T., & Malenka, D. (1992). Studying Outcomes and Hospital Utilization in the Elderly: The Advantages of a Merged Data Base for Medicare and Veterans Affairs Hospitals. Medical Care, 30(5), 377-391.
Level	Facility	See S.7.8 for a full list of care settings included
Setting	Inpatient/Hospital	See S.7.8 for a full list of care settings included To estimate payments for a 30-day episode of care for PN we included payments for all care settings, services, and supplies, except drugs covered under Part D Medicare claims. We did not include Part D since a large proportion of Medicare beneficiaries are not enrolled in Part D and there is variation in enrollment status across and within states. Including payments for Part D services would thus bias payments upwards for hospitals with high Part D enrollment. By following patients through an episode of care for PN, CMS and hospitals can gain key insights into the drivers of payments and how practice patterns vary across providers. We include payments for the following care settings below in the measure:

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
		Inpatient hospital facility and physician Outpatient hospital facility and physician Skilled nursing facility and physician Hospice facility and physician Home health facility and physician Inpatient psychiatric facility and physician Inpatient rehab facility and physician Long-term care hospital facility Clinical labs facility and physician Comprehensive outpatient rehab facility and physician Outpatient rehab facility and physician Renal dialysis facility and physician Community mental health centers facility and physician DME/POS/PEN Observation stay facility Part B drugs Ambulance and ambulance physician Emergency department facility and physician Physician office Federally qualified health centers facility and physician Rural health clinics facility and physician Ambulatory surgical centers facility and physician We also include physician payments for the following care settings: Indian health service free-stand facility Indian health service provider facility Tribal free-standing facility Tribal facility Military treatment facility Independent clinic State or local health clinic Mass immunization center Walk-in retail health clinic

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
		Urgent care facility Unassigned Pharmacy School Homeless Shelter Prison Group Home Mobile Unit Temporary Lodging Birthing Center Intermediary Care/Mentally Retarded Residential Substance Abuse Psychiatric Residential Facility Non-Residential Substance Abuse Other Physician Other carrier claims with HCPCS codes P9603 or P9604 In order to determine how to assign claims, we examine the place of service code for physician claims and a combination of claim type and facility type codes to determine the facility in which care was provided. Depending on the facility and physician codes we standardize payments differently. Information on how we standardize claims can be found in the methodology report.
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	*

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	*
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	This measure estimates hospital-level, risk-standardized payments for a 30-day episode of care for PN. To this end, we constructed a cohort of PN patients by examining the principal discharge diagnosis in administrative claims data. Specifically, we included Medicare fee-for-service patients 65 or older with a principal discharge diagnosis of an AMI (defined by ICD-10 codes in attached data dictionary). We then applied several exclusion criteria as detailed in S.9.1. Once our cohort was finalized we examined all payments for these patients (including co-pays, co-insurance, and deductibles) that occurred within 30 days of the index admission. We included payments for all care settings, except Part D Medicare claims. We standardized payments across providers by removing or averaging geographic differences and removing policy adjustments from the total payment for that service. These payments were then assigned to the initial admitting hospital. As part of our model, we risk adjusted these payments for patient comorbidities listed in outpatient and inpatient claims in the 12 months prior to the index admission as well as the secondary diagnoses included in the index admission. We then used hierarchical generalized linear regression models to calculate a risk-standardized payment for each hospital.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia)	To construct the measure, we use Medicare administrative claims data. These data contain claims for all care settings, supplies, and services as outlined in Section S.7.8. (except Part D). Claim payment data are organized by the setting, supply, or service in which they were rendered. Standard Medicare payment rates were assigned to each service based on claim type, facility type, and place of service codes. These payments are then summed by individual patients. To create a hospital-level measure, we aggregate the payments for all eligible patients at each hospital.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	URL
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient	https://qualitynet.cms.gov/files/5d0d37f3764be766b0101db2?filename=PN_Pymnt_MeasMeth_Rprt_092513.pdf

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes	

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	
Risk Adjustment	Statistical risk model	*
Stratification	*	*
Type Score	Rate/proportion better quality = lower score	This measure examines payments for a 30-day episode of care beginning with an admission for PN and extending to 30-days post-admission. We determine if a patient has an PN by examining the principal discharge diagnosis code in the administrative data. If a patient has a principal discharge diagnosis of any other condition, even if this includes a secondary diagnosis of PN, this admission is not considered as an index admission. Therefore, the concurrency of clinical events is not an issue when determining what triggers the episode of care. Once, an episode is triggered, however, we include payments for all care settings, except Part D Medicare claims. The model risk adjusts for comorbidities listed in outpatient and inpatient claims in the 12 months prior to the index admission as well as the secondary diagnoses included in the index admission that are not considered complications of care. The measure includes payments for all care settings, except Part D, that occur during the 30-day window. If a claim for a complimentary service was filed in the study window, then it would be included in the measure.
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the	

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of	

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)	5.1 Identified measures: As part of the measure methodology we compare payments for a hospital with the expected payment amounts for an average hospital with the same case mix. While we include all hospitals when estimating the risk-adjustment model, we do not report RSPs for hospitals with fewer than 25 PN admissions, since estimates for hospitals with fewer procedures are less reliable and CMS's past approach to public reporting has been not to report these results. 5a.1 Are specs completely harmonized? Comparative estimates are provided by classifying hospitals as less than average, no different than average, or greater than average payment depending on the span of their confidence interval in comparison with the national average payment amount (i.e., the benchmark). To categorize hospital payments, we estimate each hospital's RSP and the corresponding 95% interval estimate. As with all estimates, there is a degree of uncertainty associated with the RSP. The interval estimate is a range of probable values around the RSP that characterizes the amount of uncertainty associated with the estimate. A 95% interval estimate indicates that there is 95% probability that the true value of the RSP lies between the lower limit and the upper limit of the interval. In an effort to provide fair

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it	comparisons, we provide three categories (less than, no different than, or greater than the national average payment amount), which allows for conservative discrimination of hospital RSPs. 5a.2 If not completely harmonized, identify difference, rationale, impact: 5b.1 If competing, why superior or rationale for additive value:

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	2579: Care Coordination
	may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	

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Comparison of NQF 0468 and NQF 3502

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date for patients who are between the ages of 50 and 94. Please note that in parallel with the hybrid HWM measure, we are submitting a claims-only HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	or patients hospitalized in Veterans Health Administration (VA) facilities.	hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e). Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure. Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment). Differences in the measure, data, and testing that reflect limitations in data availability 1. Dataset used for development, some testing (see below for differences), and measure results: a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database. b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information. 2. Age of patients in cohort: a. The claims-only measure includes Medicare FFS patients, age 65-94. b. The hybrid measure includes all patients age 50-94 (see later discussion for justification) 3. External empiric validity testing a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 4. Socioeconomic risk factor analyses a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 5. Exclusion analyses

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure. 6. Meaningful differences a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure. Difference between the two measures when fully harmonized, prior to implementation: 1. Risk adjustment: a. The claims-only measure uses administrative claims data only for risk adjustment b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing	Claims, Electronic Health Records, Other Clinical-Hybrid Dataset Constructed using Kaiser Permanente Northern California matched administrative claims and electronic health record (EHR) data, admission dates from October 1, 2015 – December 30, 2016. This data source was used for measure testing. (An earlier Kaiser dataset from that included all admissions for adult patients to any of their member hospitals between January 1, 2009 and June 30, 2015 was used for measure development, as described in the attached methodology report). The two data sources listed below were used for testing the claims-based measure; the hybrid testing form includes some testing data from the claims-based measure (for example, for the social risk factor and external validation analyses). HWM claims-only datasets: Medicare Part A Inpatient Claims Data The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission. This

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	data was used along with the Medicare Enrollment Database (EDB) for testing the claims-based measure. Medicare Enrollment Database (EDB) This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment. No data collection instrument provided Attachment Del18b2HOP5HWMHybridDataDictionary01072019.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital, Other Home-based primary care and home-based palliative care); Settings include: Home, Boarding home, Domiciliary, Assisted Living Facilities, Rest Home or Custodial Care Services
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure	The measure outcome is death from any cause within 30 days of the admission date of the index admission. The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	The cohort includes inpatient admissions for a wide variety of conditions for patients aged between 50 and 94 years old who were discharged from short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details. The age range for this measure differs from that of the claims-only measure due to the limited size of the dataset used for testing. The intent is to harmonize the age range of the hybrid measure with the age range of the claims-only measure, so that both will include admissions for patients age 65-94.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	The index cohort includes all inpatient admissions for patients aged 50-94 years old. (Note: The intention is to fully harmonize the cohort definition with the claims-only measure so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing due to the limited dataset available that included the EHR data elements needed to calculate this measure. Note that the risk model already includes age in years, as a risk variable.) An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients: 1. Not transferred from another acute care facility Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any “transfer-in” hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission). 2. Aged between 50 and 94 years

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		The hybrid measure is intended for the Medicare FFS population but was tested in a limited dataset due to the EHR data elements included. The use of a small dataset required that we expand the sample by including admissions from patients ages 50 to 94 years. Note that the measure already adjusts for age. 3. Not admitted for primary psychiatric diagnoses Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab). 4. Not admitted for rehabilitation Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab). 5. Not enrolled in hospice at the time of, or 12 months prior to, their index admission Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal 6. Not enrolled in hospice within two days of admission Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received. 7. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab). 8. Without any diagnosis of metastatic cancer

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab). 9. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list. In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure. The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability. The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure; 2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams. The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures. For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel. The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions. The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.
Exclusions	The mortality measure excludes index admissions for patients:	The measure excludes index admissions for patients:

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data; 2. Discharged against medical advice (AMA); 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data. Rationale: The measure does not include stays for patients where the admission date is after the date of death, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data. 2. Discharged against medical advice (AMA) Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240). Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals. 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year. Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded. Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	*	*
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by	The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique. Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories).

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of "predicted" deaths to the number of "expected" deaths at a given hospital. The predicted number of deaths is based on the hospital's performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation's performance with that hospital's case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix and service mix, to be compared to an average hospital's performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality. To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period. The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. (Note that in the case of the hybrid measure, we are presenting data from 9 of the total 15 divisions due to limitations in availability of electronic health records data). The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)	5.1 Identified measures:

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them	5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: This hybrid HWM measure incorporates patient-level clinical data from the EHR into the risk adjustment model, compared to the claims-only hospital-wide mortality measure. This hybrid HWM measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer, whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include as many have survival as their primary goal, however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into in order to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into six categories, or “specialty cohorts”, while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. HWM captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures. 5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

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Comparison of NQF 0468 and NQF 3504

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals	The measure estimates a hospital-level 30-day hospital-wide risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for Medicare fee-for-service (FFS) patients who are between the ages of 65 and 94. Please note that in parallel with the claims-only HWM measure, we are submitting a hybrid HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	or patients hospitalized in Veterans Health Administration (VA) facilities.	implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e). Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure. Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment). Differences in the measure, data, and testing that reflect limitations in data availability 1. Dataset used for development, some testing (see below for differences), and measure results: a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database. b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information. 2. Age of patients in cohort: a. The claims-only measure includes Medicare FFS patients, age 65-94. b. The hybrid measure includes all patients age 50-94 (see later discussion for justification) 3. External empiric validity testing a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 4. Socioeconomic risk factor analyses a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 5. Exclusion analyses

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure. 6. Meaningful differences a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure. Difference between the two measures when fully harmonized, prior to implementation: 1. Risk adjustment: a. The claims-only measure uses administrative claims data only for risk adjustment b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including:	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: 1. Medicare Part A Inpatient: The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission, hospitalized from July 1, 2016-June 30, 2017. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission. 2. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment. No data collection instrument provided Attachment Del18b1HOP5HWMClaimsDataDictionary01072019.xlsx

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx	
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.	The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure outcome is death from any cause within 30 days of the admission date of the index admission, for Medicare FFS patients identified using the Medicare Enrollment Database (EDB). The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.	The cohort includes inpatient admissions for a wide variety of conditions for Medicare FFS patients aged between 65 and 94 years old who were admitted to short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).	An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients: 1. Enrolled in Medicare FFS Part A for at least 12 months prior to the date of admission and during the index admission Rationale: Claims data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment criterion ensures a full year of administrative data is available for risk adjustment. 2. Not transferred from another acute care facility Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any “transfer-in” hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission). 3. Aged between 65 and 94 years Rationale: Medicare patients younger than 65 are not included in the measure because they usually qualify for the program due to severe disability and are considered to be clinically distinct from Medicare patients 65 and over. Patients over age 94 are not included to avoid holding hospitals responsible for the survival of the very elderly patients, who may be less likely to have survival as a primary goal.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		Note that the hybrid measure (submitted for NQF endorsement in parallel with the claims-only measure) differs from the claims-only measure in terms of the age range of included admissions; the hybrid measure includes all inpatient admissions for patients aged 50-94 years old. The intention is to fully harmonize the cohort definitions for the two measures, so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing for the hybrid measure due to the limited dataset available that included the EHR data elements needed to calculate the hybrid measure. Note that the risk model already includes age in years, as a risk variable.) 4. Not admitted for primary psychiatric diagnoses Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab). 5. Not admitted for rehabilitation Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab). 6. Not enrolled in hospice at the time of, or 12 months prior to, their index admission Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal. 7. Not enrolled in hospice within two days of admission Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received. 8. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab). 9. Without any diagnosis of metastatic cancer Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab). 10. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list. In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure. The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability. The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure; 2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams. The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures. For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel. The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions. The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.
Exclusions	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.	The measure excludes index admissions for patients: 1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data; 2. Discharged against medical advice (AMA); 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions within the measurement year.
Exclusion Details	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.	1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data Rationale: The measure does not include stays for patients where the admission date is after the date of death in the Medicare Enrollment Database, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data. 2. Discharged against medical advice (AMA) Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240) Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions.

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.	These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals. 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year. Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded. Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	N/A	N/A
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the	The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully	health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique. Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of "predicted" deaths to the number of "expected" deaths at a given hospital. The predicted number of deaths is based on the hospital's performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation's performance with that hospital's case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix and service mix, to be compared to an average hospital's performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality. To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period. The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	composite SMR. The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.
Submission items	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing	5.1 Identified measures: 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: This claims-only hospital-wide mortality (HWM) measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer (with some exceptions), whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include in the HWM measure as many have survival as their primary goal; however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore, are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into, to more accurately risk adjust for case-mix and service-mix. The

Measures	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A	readmission measure divides patients into five categories, or "specialty cohorts", while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. Hospital-wide mortality captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures. 5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

Comparison of NQF 1893 and NQF 0275

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
Steward	Centers for Medicare & Medicaid Services	Agency for Healthcare Research and Quality
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the	Admissions with a principal diagnosis of chronic obstructive pulmonary disease (COPD) or asthma per 100,000 population, ages 40 years and older. Excludes obstetric admissions and transfers from other institutions.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
	hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	[NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and	Claims While the measure is tested and specified using data from the Healthcare Cost and Utilization Project (HCUP) (see section 1.1 and 1.2 of the measure testing form), the measure specifications and software are specified to be used with any ICD-9-CM- or ICD-10-CM/PCS coded administrative billing/claims/discharge dataset. Available at measure-specific web page URL identified in S.1 Attachment PQI_05_Chronic_Obstructive_Pulmonary_Disease_-COPD-_or_Asthma_in_Older_Adults_Admission_Rate.xlsx

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
	outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	
Level	Facility	Population : Community, County or City
Setting	Inpatient/Hospital	Other all community based care
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	Discharges, for patients ages 40 years and older, with either (1) a principal ICD-10-CM diagnosis code for COPD (ACCOPDD*) (excluding acute bronchitis); or (2) a principal ICD-10-CM diagnosis code for asthma (ACSASTD*). Exclude cases (1) with any-listed ICD-10-CM diagnosis codes for cystic fibrosis and anomalies of the respiratory system (RESPAN*); (2) transfer from a hospital (different facility); (3) transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF); (4) transfer from another health care facility; (5) with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing).
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure	See technical specifications for full list of codes included in numerator.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
	As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	Population ages 40 years and older in metropolitan area or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries 3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	The term “metropolitan area” (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, “area” could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area, or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software. See AHRQ QI website for 2014 Population File Denominator report for calculation of population estimates embedded within AHRQ QI software programs. http://www.qualityindicators.ahrq.gov/Downloads/Software/SAS/V50/AHRQ_QI_Population_File_V50.pdf

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	- -
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	- -

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
Risk Adjustment	Statistical risk model	No risk adjustment or risk stratification
Stratification	- -	- -
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses.	Risk adjustment is not currently included in the ICD-10-CM/PCS v7.0 of the AHRQ QI specifications, due to the transition to ICD-10-CM/PCS (October 1, 2015). At least one full year of data coded in ICD-10-CM/PCS is needed in order to develop robust risk adjustment models. A full year of ICD-10-CM/PCS coded all-payer data will not be available until 2018. AHRQ will announce an anticipated date as soon as one is known. The AHRQ QI v7.0 software (SAS and WinQI) for use with ICD-10-CM/PCS produces observed rates, which may be used to evaluate performance within hospitals. However, caution should be used when comparing observed rates across hospitals because observed rates do not account for differences in patient populations (i.e., case mix).

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
	It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who	5.1 Identified measures: 5a.1 Are specs completely harmonized? 5a.2 If not completely harmonized, identify difference, rationale, impact: 5b.1 If competing, why superior or rationale for additive value:

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)
	are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	

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Comparison of NQF 1893 and NQF 0468

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal	The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	This claims-based measure is used for a cohort of patients aged 65 years or over older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals. Additional details are provided in S.9 Denominator Details.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	Part A during the index admission, or those who are VA beneficiaries 3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	2. Enrolled in Medicare fee-for-service (FFS); 3. Aged 65 or over; 4. Not transferred from another acute care facility; and 5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission. We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	The mortality measure excludes index admissions for patients: 1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility; 2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 4. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.	1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim. Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia. 2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	N/A	N/A
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-	clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period.	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
	Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231. 5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 1893 and NQF 0506

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and older discharged from the hospital with either a principal discharge diagnosis of pneumonia (including aspiration pneumonia) or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). Readmission is defined as an unplanned readmission for any cause within 30 days of the discharge date for the index admission. Readmissions are classified as planned and unplanned by applying the planned readmission algorithm. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived from the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) index score at the patient nine-digit zip code level for use in studying the association between our measure and social risk factors (SRFs). References Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_PNreadmission_Fall2020_final_7.22.20.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	The outcome for this measure is 30-day readmissions. We define readmission as an inpatient acute care admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients 65 and older discharged from the hospital with a principal diagnosis of pneumonia, including aspiration pneumonia or a principal diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary diagnosis of severe sepsis. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
		However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index pneumonia admission, excluding planned readmissions as defined below. Planned Readmission Algorithm (Version 4.0) The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare claims and VA administrative data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital. The planned readmission algorithm has three fundamental principles: 1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/immunotherapy, rehabilitation); 2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and, 3. Admissions for acute illness or for complications of care are never planned. The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures. In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the pneumonia measure without modifications. The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older.	The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries 3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; 2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries; 3. Aged 65 or over; 4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and, 5. Not transferred from another acute care facility.
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	The 30-day pneumonia (PN) readmission measure excludes index admissions for patients: 1. Discharged against medical advice (AMA); 2. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries); 3. Admitted within 30 days of a prior index admission for pneumonia.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	The pneumonia readmission measure excludes index admissions for patients: 1. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 2. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database. Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted. 3. Pneumonia admissions within 30 days of discharge from a qualifying pneumonia index admission are identified by comparing the discharge date from the index admission with subsequent admission dates. Rationale: Additional pneumonia admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	*	*
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At	The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.	models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality. The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology). References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified	5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20) 0279 : Community Acquired Pneumonia Admission Rate (PQI 11) 1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN) 2882 : Excess days in acute care (EDAC) after hospitalization for pneumonia 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization
	cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	

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Comparison of NQF 1893 and NQF 1891

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and over discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD. The outcome (readmission) is defined as unplanned readmission for any cause within 30 days of the discharge date for the index admission (the admission included in the measure cohort). A specified set of planned readmissions do not count in the readmission outcome. CMS annually reports the measure for patients who are 65 years or older and are enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual-eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated AHRQ SES index score at the patient nine-digit zip code level for use in studying the association between our measure and SRFs. References Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDreadmission_Fall2020_final_7.22.20.xlsx

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	The outcome for this measure is 30-day readmission. We define readmission as an inpatient admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients discharged from the hospital with a principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index COPD admission, excluding planned readmissions as defined below. Planned Readmission Algorithm (Version 4.0) The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare and VA administrative claims data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital. The planned readmission algorithm has three fundamental principles: 1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/ immunotherapy, rehabilitation); 2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and, 3. Admissions for acute illness or for complications of care are never planned.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
		The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures. In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the COPD measure without modifications. The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	The cohort includes admissions for patients aged 65 or older, who have been discharged from the hospital with either a principal discharge diagnosis of COPD OR a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD and with a complete claims history for the 12 months prior to admission. Additional details are provided in S.9 Denominator Details.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries 3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of COPD with exacerbation; 2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B Medicare for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries; 3. Aged 65 or over; 4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and, 5. Not transferred to another acute care facility.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	The 30-day COPD readmission measures exclude index admissions for patients: 1. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries); 2. Discharged against medical advice (AMA); and, 3. 3. Admitted within 30 days of a prior index admission for COPD.
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	1. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database. Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted. 2. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. COPD admissions within 30 days of discharge from a qualifying COPD index admission are identified by comparing the discharge date from the index admission with subsequent admission dates. Rationale: Additional COPD admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.
Risk Adjustment	Statistical risk model	Statistical risk model

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
Stratification	*	*
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors	The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of discharge from the index admission using age, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality. The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology). References: Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions	5.1 Identified measures: 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization 2879 : Hybrid Hospital-Wide Readmission (HWR) Measure with Claims and Electronic Health Record Data 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization
	3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A

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Comparison of NQF 1893 and NQF 2888

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal	Rate of risk-standardized acute, unplanned hospital admissions among Medicare fee-for-service (FFS) beneficiaries 65 years and older with multiple chronic conditions (MCCs) who are assigned to an Accountable Care Organization (ACO).

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
	discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not	Claims, Enrollment Data, Other Medicare administrative claims and enrollment data from calendar years 2017 and 2018, 2013-2017 American Community Survey, and 2017-2018 Area Health Resource File. No data collection instrument provided Attachment NQF_ACO_MCC_DataDictionary_07.09.20.xlsx

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
	required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	
Level	Facility	Other
Setting	Inpatient/Hospital	Outpatient Services
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	The outcome for this measure is the number of acute unplanned hospital admissions per 100 person-years at risk for admission during the measurement period.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	Outcome Definition The outcome for this measure is the number of acute, unplanned hospital admissions per 100 person-years at risk for admission during the measurement period. Time Period Number of admissions are counted while the patient is considered at risk for an admission during the measurement year. Excluded Admissions The numerator (outcome) does not include the following admissions because they do not reflect the quality of care provided by ambulatory care clinicians who are managing the care of MCC patients:

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
		1. Planned hospital admissions; 2. Admissions that occur directly from a skilled nursing facility (SNF) or acute rehabilitation facility; 3. Admissions that occur within a 10-day "buffer period" of time after discharge from a hospital, SNF, or acute rehabilitation facility; 4. Admissions that occur after the patient has entered hospice; 5. Admissions related to complications of procedures or surgeries; 6. Admissions related to accidents or injuries; or 7. Admissions that occur prior to the first visit with the assigned clinician or clinician group. Clarification regarding the 10-day "buffer period" The 10-day "buffer period" is a numerator (or outcome) exclusion but it also affects the denominator (person-time at risk); see below in Section S.6 and S.7. The 10-day buffer period (10 days following discharge from a hospital) is a period of transition back to community-based care, and other factors in addition to ambulatory care, including care received in the hospital and post-discharge planning, contribute to the risk of admission; therefore, the measure does not hold clinicians accountable for admissions in this timeframe. This buffer period allows time for patients to be seen within 7 days of discharge as recommended in CMS's Transitional Care Management (TCM) service guidelines and for the ambulatory care provider's care plan to take effect. CMS's TCM service guidelines encourage providers to have a face-to-face visit within 7 days of discharge for Medicare patients with high medical decision complexity. Identification of planned admissions To identify planned admissions, the measure adopted an algorithm previously developed for CMS's hospital readmission measures, CMS's Planned Readmission Algorithm Version 4.0. [1,2] In brief, the algorithm uses the procedure codes and principal discharge diagnosis code on each hospital claim to identify admissions that are typically planned. A few specific, limited types of care are always considered planned (for example, major organ transplant, rehabilitation, and maintenance chemotherapy). Otherwise, a planned admission is defined as a non-acute admission for a scheduled procedure (for example, total hip replacement or cholecystectomy). Admissions for an acute illness are never considered

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
		planned. For specific codes included in the planned admission algorithm, please see Tables PAA1-PAA4 with the codes for the CMS Planned Admission Algorithm in the accompanying data dictionary. Identification of admissions that occur directly from a SNF or acute rehabilitation facility Claims for SNF and acute rehabilitation facility stays, which help determine the outcome definition, were obtained using CMS's Integrated Data Repository (IDR). Identification of admissions that occur after the patient has entered hospice The status of enrollment in Medicare Parts A and B and Medicare's hospice benefit for the measurement year and the year prior were obtained from the CMS Medicare Enrollment Database. Identification of admissions related to complications of procedures or surgeries (including small bowel obstruction), and accidents or injuries Using the Agency for Healthcare Research and Quality's (AHRQ's) Clinical Classifications Software (CCS), which clusters diagnoses into clinically meaningful categories using International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes, we exclude from the outcome admissions related to the following 23 CCS categories. For specific ICD codes included, please refer to AHRQ's CCS Version 2019.1, Fiscal Year 2020. a) Complications of procedures or surgeries 1. 145: Intestinal obstruction without hernia 2. 237: Complication of device; implant or graft 3. 238: Complications of surgical procedures or medical care 4. 257: Other aftercare b) Accidents or injuries 5. 2601 E Codes: Cut/pierce 6. 2602 E Codes: Drowning/submersion 7. 2604 E Codes: Fire/burn 8. 2605 E Codes: Firearm 9. 2606 E Codes: Machinery 10. 2607 E Codes: Motor vehicle traffic (MVT)

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
		11. 2608 E Codes: Pedal cyclist; not MVT 12. 2609 E Codes: Pedestrian; not MVT 13. 2610 E Codes: Transport; not MVT 14. 2611 E Codes: Natural/environment 15. 2612 E Codes: Overexertion 16. 2613 E Codes: Poisoning 17. 2614 E Codes: Struck by; against 18. 2615 E Codes: Suffocation 19. 2616 E Codes: Adverse effects of medical care 20. 2618 E Codes: Other specified and classifiable 21. 2619 E Codes: Other specified; NEC 22. 2620 E Codes: Unspecified 23. 2621 E Codes: Place of occurrence Citations 1. Yale New Haven Health Services Corporation – Center for Outcomes Research & Evaluation (YNHHSC/CORE). 2018 All-Cause Hospital Wide Measure Updates and Specifications Report - Hospital-Level 30-Day Risk-Standardized Readmission Measure –Version 7.0. Centers for Medicare & Medicaid Services; March 2018. 2. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	Patients included in the measure (target patient population) The target patient population for the outcome includes Medicare FFS patients aged 65 years and older with multiple chronic conditions (MCCs). Attribution: The outcome is attributed to the ACO to which the patient is assigned. (More details are provided in the next section.) Person-time at risk Persons are considered at risk for hospital admission if they are alive, enrolled in FFS Medicare, and not in the hospital during the measurement period. In addition to time spent in the hospital, we also exclude from at-

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
		risk time: 1) time spent in a SNF or acute rehabilitation facility; 2) the time within 10 days following discharge from a hospital, SNF, or acute rehabilitation facility; and 3) time after entering hospice care.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries 3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	Patients included in the measure (target patient population) The cohort, or group of patients included in the measure, is comprised of patients whose combinations of chronic conditions put them at high risk of admission and whose admission rates could be lowered through better care. This definition reflects NQF's "Multiple Chronic Conditions Measurement Framework," which defines patients with MCCs as people "having two or more concurrent chronic conditions that … act together to significantly increase the complexity of management, and affect functional roles and health outcomes, compromise life expectancy, or hinder self-management." [1] The specific inclusion criteria are as follows: 1. Patient is alive at the start of the measurement period and has two or more of nine chronic condition disease groups in the year prior to the measurement period. Chronic conditions, except for diabetes, are defined using CMS's Chronic Conditions Data Warehouse (CCW). For diabetes, we used the diabetes cohort definition from the Accountable Care Organization (ACO) diabetes admission measure developed by CORE (v2018a ACO-36) as opposed to the definition used in CCW, which includes diagnoses for secondary and drug-induced diabetic conditions that are not the focus of the MIPS MCC admission measure. See Table 1 in the accompanying data dictionary for the specific codes used to define the nine cohort-qualifying conditions. 1. Acute myocardial infarction (AMI), 2. Alzheimer's disease and related disorders or senile dementia, 3. Atrial fibrillation, 4. Chronic kidney disease (CKD), 5. Chronic obstructive pulmonary disease (COPD) or asthma, 6. Depression, 7. Diabetes, 8. Heart failure, and 9. Stroke or transient ischemic attack (TIA).

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
		Rationale: As noted above, this definition of MCCs is consistent with NQF's "Multiple Chronic Conditions Measurement Framework" and except for diabetes, is the same as the original ACO MCC measure [2]. Diabetes was added as a cohort-qualifying condition based on input from our TEP for the MIPS version of this measure, and further guidance from CMS. The inclusion of diabetes acknowledges the complexity that diabetes introduces to caring for patients with MCCs. 2. Patient is aged =65 years at the start of the year prior to the measurement period. Rationale: Younger Medicare patients represent a distinct population with dissimilar characteristics and outcomes. Additionally, these patients tend to cluster among certain providers. These factors make risk adjustment difficult. 3. Patient is a Medicare FFS beneficiary with continuous enrollment in Medicare Parts A and B during the year prior to the measurement period. Rationale: Enrollment is necessary to provide clinical information for cohort identification and risk adjustment. 4. Patient is attributed to a Medicare Shared Savings Program ACO. Rationale: This measure is designed for ACOs that are part of MSSP and thus includes patients with MCCs who are attributed to one of the MSSP ACOs. The outcome is attributed to the ACO to which the patient is assigned. Patients are assigned to ACOs according to the specific ACO program assignment algorithm. This measure is limited to ACOs that are part of the Medicare Shared Savings Program (MSSP)where patients are retrospectively assigned to an ACO if they obtained the plurality of their primary care through the ACO's providers during the measurement year. Information on ACO beneficiary assignment can be found here: https://www.cms.gov/Medicare/Medicare-Feefor-Service-Payment/sharedsavingsprogram/Downloads/Shared-Savings-Losses-Assignment-Spec-V6.pdf. Citations 1. National Quality Forum. Multiple Chronic Conditions Measurement Framework.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
		http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=71227. Accessed February 20, 2019. 2. Drye EE, Altaf FK, Lipska KJ et al. Defining Multiple Chronic Conditions for Quality Measurement. Med Care. 2018; 56(2):193-201.
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	The measure excludes the following patients: 1. Patients without continuous enrollment in Medicare Part A or B during the measurement period. 2. Patient enrolled in hospice at any time during the year prior to the measurement year or at the start of the measurement year. 3. Patients without any visits with any of the TINs associated with the attributed ACO during the measurement year or the year prior to the measurement year. 4. Patients not at risk for hospitalization during the measurement year.
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	The rationale for each exclusion is provided below: 1. Patients without continuous enrollment in Medicare Part A or B during the measurement period. Rationale: The measure excludes these patients to ensure full data availability for outcome assessment and attribution. 2. Patients enrolled in hospice during the year prior to the measurement year or at the start of the measurement year. Rationale: The measure excludes these patients even though once a patient enters hospice care, a goal of care is to prevent the need for hospital care. However, it may be difficult to influence end-of-life care once a patient is enrolled in hospice and served by a hospice team. 3. Patients without any visits (Evaluation & Management [E&M] or other) with any of the TINs associated with the attributed ACO during the measurement year and the year prior to the measurement year. Rationale: These patients are excluded because the start of their time-at-risk cannot be ascertained.

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		4. Patients not at risk for hospitalization at any time during the measurement year. Rationale: The outcomes for these patients cannot be assessed as they are not at risk. For example, if the first visit to the attributed ACO occurred after the patient has entered hospice, the patient would not have any time at risk and would thus be excluded. See section 2.4.3 of the attached MIPS MCC technical report for methods used to calculate person-time at risk. Clarification of 10-day buffer period: The 10-day "buffer period" is a numerator (or outcome) exclusion (see section S.5) but it also affects the denominator (person-time at risk). Persons are considered at risk for hospital admission if they are alive, enrolled in FFS Medicare, and not in the hospital during the measurement period. In addition to time spent in the hospital, we also exclude from at-risk time: 1) time spent in a SNF or acute rehabilitation facility; 2) the time within 10 days following discharge from a hospital, SNF, or acute rehabilitation facility; and 3) time after entering hospice care. Note that the patient is not removed from the denominator, we are just subtracting the 10-days of person-time. The 10-day buffer period (10 days following discharge from a hospital) is a period of transition back to community-based care, and other factors in addition to ambulatory care, including care received in the hospital and post-discharge planning, contribute to the risk of admission; therefore, the measure does not hold clinicians accountable for admissions in this timeframe. This buffer period allows time for patients to be seen within 7 days of discharge as recommended in CMS's Transitional Care Management (TCM) service guidelines and for the ambulatory care provider's care plan to take effect. CMS's TCM service guidelines encourage providers to have a face-to-face visit within 7 days of discharge for Medicare patients with high medical decision complexity.
Risk Adjustment	Statistical risk model	Statistical risk model

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
Stratification	*	Not applicable. This measure is not stratified.
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.	We begin by identifying the cohort of MCC patients by applying the inclusion/exclusion criteria. We use MSSP ACO assignment to identify MCC patients attributed to MSSP ACOs. The number of admissions and time at risk in the measurement period are then calculated for each patient based on our measure specifications. The measure is risk-adjusted for demographic, clinical, and social risk factors. For the score calculation, the measure uses a hierarchical (two-level) statistical model that accounts for the clustering of patients within ACOs and accommodates the varying patient sample sizes of different providers. The measure uses a negative binomial with linear variance (NB-1) model since the measure's outcome is a count of the number of admissions for MCC patients during the measurement period. The first level of the model adjusts for patient factors. The relationship between patient risk factors and the outcome of admissions is determined based on all patients attributed to ACOs. Therefore, the "expected" number of admissions (described below) for each ACO is based on the performance of all ACOs in the MSSP program, nationwide. The second level of the model estimates a random-intercept term that reflects the ACO's contribution to admission risk, based on their actual admission rate, the performance of other providers, their case mix, and their sample size. The measure score is a risk-standardized acute admission rate (RSAAR), calculated as the ratio of the number of predicted admissions to the number of expected admissions multiplied by the crude national rate. The predicted to expected ratio of admissions is analogous to an observed over expected ratio, but the numerator accounts for clustering, sample-size variation, and provider-specific performance. The expected number of admissions is calculated based on the provider's case mix and average intercept among all MSSP ACOs. The predicted number of admissions is calculated based on the provider's case mix and the estimated provider-specific random intercept term. We multiply the predicted to expected ratio for each provider by a constant – the crude rate of acute, unplanned admissions among all MSSP ACOs – for ease of interpretation.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
	The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)	5.1 Identified measures: 3597 : Clinician-Group Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions under the Merit-based Incentive Payment System 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: Clinician-Group Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions under the Merit-based Incentive Payment System (MIPS MCC measure): The measure specifications are

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions
	1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	harmonized to the fullest extent possible. The only differences are for the CMS programs and measurement levels for which they are intended: for example, the MIPS measure is attributed and scored for clinician groups under MIPS, and the ACO MCC admission measure is attributed and scored for Medicare ACOs. Hospitalizations for Ambulatory Care Sensitive Conditions for Dual-Eligible Beneficiaries Unlike this updated measure which is specified for evaluating ACOs, the ACSC DE measure is a state-level measure. The cohorts, outcomes, and the risk-adjustment models differ accounting for differences in their target populations and measurement settings. -Cohort: Unlike the ACO MCC measure which targets patients with two or more of eight chronic conditions age >65 years, the ACSC DE measure targets dual-eligible adults age >18 years within each state; it does not focus on patients with certain chronic conditions. -Outcome: Unlike the ACO MCC measure which targets unplanned admissions, the ACSC DE measure is a composite of ACSC admissions. The ACSC DE measure outcome is ACSC admissions per 1,000 beneficiaries for ACSC by chronic, acute, and both conditions -Risk adjustment: Like the ACO MCC measure, the ACSC DE measure is risk-adjusted. Both measures adjust for patient demographics and comorbidities defined by Condition Categories (CCs). Specifically, the ACSC measure adjusts for age and sex, comorbidities, condition interactions, disability-by-condition interactions, and the total number of conditions. 5b.1 If competing, why superior or rationale for additive value: N/A

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Comparison of NQF 1893 and NQF 3502

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date for patients who are between the ages of 50 and 94. Please note that in parallel with the hybrid HWM measure, we are submitting a claims-only HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e). Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure. Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment). Differences in the measure, data, and testing that reflect limitations in data availability 1. Dataset used for development, some testing (see below for differences), and measure results: a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database. b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information. 2. Age of patients in cohort:

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		a. The claims-only measure includes Medicare FFS patients, age 65-94. b. The hybrid measure includes all patients age 50-94 (see later discussion for justification) 3. External empiric validity testing a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 4. Socioeconomic risk factor analyses a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 5. Exclusion analyses a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure. 6. Meaningful differences a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure. Difference between the two measures when fully harmonized, prior to implementation: 1. Risk adjustment: a. The claims-only measure uses administrative claims data only for risk adjustment b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:	Claims, Electronic Health Records, Other Clinical-Hybrid Dataset Constructed using Kaiser Permanente Northern California matched administrative claims and electronic health record (EHR) data,

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	admission dates from October 1, 2015 – December 30, 2016. This data source was used for measure testing. (An earlier Kaiser dataset from that included all admissions for adult patients to any of their member hospitals between January 1, 2009 and June 30, 2015 was used for measure development, as described in the attached methodology report). The two data sources listed below were used for testing the claims-based measure; the hybrid testing form includes some testing data from the claims-based measure (for example, for the social risk factor and external validation analyses). HWM claims-only datasets: Medicare Part A Inpatient Claims Data The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission. This data was used along with the Medicare Enrollment Database (EDB) for testing the claims-based measure. Medicare Enrollment Database (EDB) This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment. No data collection instrument provided Attachment Del18b2HOP5HWMHybridDataDictionary01072019.xlsx

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital, Other Home-based primary care and home-based palliative care); Settings include: Home, Boarding home, Domiciliary, Assisted Living Facilities, Rest Home or Custodial Care Services
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure outcome is death from any cause within 30 days of the admission date of the index admission. The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	The cohort includes inpatient admissions for a wide variety of conditions for patients aged between 50 and 94 years old who were discharged from short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details. The age range for this measure differs from that of the claims-only measure due to the limited size of the dataset used for testing. The intent is to harmonize the age range of the hybrid measure with the age range of the claims-only measure, so that both will include admissions for patients age 65-94.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries	The index cohort includes all inpatient admissions for patients aged 50-94 years old. (Note: The intention is to fully harmonize the cohort definition with the claims-only measure so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing due to the limited dataset available that included the EHR data elements needed to calculate this measure. Note that the risk model already includes age in years, as a risk variable.)

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients: 1. Not transferred from another acute care facility Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any "transfer-in" hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission). 2. Aged between 50 and 94 years The hybrid measure is intended for the Medicare FFS population but was tested in a limited dataset due to the EHR data elements included. The use of a small dataset required that we expand the sample by including admissions from patients ages 50 to 94 years. Note that the measure already adjusts for age. 3. Not admitted for primary psychiatric diagnoses Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab). 4. Not admitted for rehabilitation Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab). 5. Not enrolled in hospice at the time of, or 12 months prior to, their index admission Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal 6. Not enrolled in hospice within two days of admission Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion

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		and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received. 7. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab). 8. Without any diagnosis of metastatic cancer Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab). 9. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list. In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure. The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as “other bacterial infections”. There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability. The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure; 2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams. The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures. For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is

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		assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel. The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions. The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	The measure excludes index admissions for patients: 1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data; 2. Discharged against medical advice (AMA); 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.	1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data. Rationale: The measure does not include stays for patients where the admission date is after the date of death, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data. 2. Discharged against medical advice (AMA) Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240).

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals. 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year. Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded. Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	*	*
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of	The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-	function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique. Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of "predicted" deaths to the number of "expected" deaths at a given hospital. The predicted number of deaths is based on the hospital's performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation's performance with that hospital's case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix and service mix, to be compared to an average hospital's performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period. The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. (Note that in the case of the hybrid measure, we are presenting data from 9 of the total 15 divisions due to limitations in availability of electronic health records data). The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization 2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period.	5.1 Identified measures: 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: This hybrid HWM measure incorporates patient-level clinical data from the EHR into the risk adjustment model, compared to the claims-only hospital-wide mortality measure. This hybrid HWM measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer, whereas those

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	patients are not included in the readmission measure. Cancer patients are appropriate to include as many have survival as their primary goal, however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into in order to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into six categories, or "specialty cohorts", while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. HWM captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures. 5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

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Comparison of NQF 1893 and NQF 3504

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.	The measure estimates a hospital-level 30-day hospital-wide risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for Medicare fee-for-service (FFS) patients who are between the ages of 65 and 94. Please note that in parallel with the claims-only HWM measure, we are submitting a hybrid HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e). Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure. Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment). Differences in the measure, data, and testing that reflect limitations in data availability 1. Dataset used for development, some testing (see below for differences), and measure results: a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database. b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		Permanente network which includes inpatient claims data information. 2. Age of patients in cohort: a. The claims-only measure includes Medicare FFS patients, age 65-94. b. The hybrid measure includes all patients age 50-94 (see later discussion for justification) 3. External empiric validity testing a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 4. Socioeconomic risk factor analyses a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form. 5. Exclusion analyses a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure. 6. Meaningful differences a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure. Difference between the two measures when fully harmonized, prior to implementation: 1. Risk adjustment: a. The claims-only measure uses administrative claims data only for risk adjustment b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.
Type	Outcome	Outcome

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Data Source	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used. Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission. The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score. References: Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.	Claims, Enrollment Data, Other Data sources for the Medicare FFS measure: 1. Medicare Part A Inpatient: The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission, hospitalized from July 1, 2016-June 30, 2017. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission. 2. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment. No data collection instrument provided Attachment Del18b1HOP5HWMClaimsDataDictionary01072019.xlsx

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx	
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.	The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.
Numerator Details	The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission. Identifying deaths in the FFS measure As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.	The measure outcome is death from any cause within 30 days of the admission date of the index admission, for Medicare FFS patients identified using the Medicare Enrollment Database (EDB). The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.
Denominator Statement	This claims-based measure is used for a cohort of patients aged 65 years or older. The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively. Additional details are provided in S.7 Denominator Details.	The cohort includes inpatient admissions for a wide variety of conditions for Medicare FFS patients aged between 65 and 94 years old who were admitted to short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details.
Denominator Details	To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria: 1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD 2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries	An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients: 1. Enrolled in Medicare FFS Part A for at least 12 months prior to the date of admission and during the index admission Rationale: Claims data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment criterion ensures a full year of administrative data is available for risk adjustment. 2. Not transferred from another acute care facility

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	3. Aged 65 or over 4. Not transferred from another acute care facility. This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).	Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any "transfer-in" hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission). 3. Aged between 65 and 94 years Rationale: Medicare patients younger than 65 are not included in the measure because they usually qualify for the program due to severe disability and are considered to be clinically distinct from Medicare patients 65 and over. Patients over age 94 are not included to avoid holding hospitals responsible for the survival of the very elderly patients, who may be less likely to have survival as a primary goal. Note that the hybrid measure (submitted for NQF endorsement in parallel with the claims-only measure) differs from the claims-only measure in terms of the age range of included admissions; the hybrid measure includes all inpatient admissions for patients aged 50-94 years old. The intention is to fully harmonize the cohort definitions for the two measures, so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing for the hybrid measure due to the limited dataset available that included the EHR data elements needed to calculate the hybrid measure. Note that the risk model already includes age in years, as a risk variable.) 4. Not admitted for primary psychiatric diagnoses Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab). 5. Not admitted for rehabilitation Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab). 6. Not enrolled in hospice at the time of, or 12 months prior to, their index admission

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal. 7. Not enrolled in hospice within two days of admission Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received. 8. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab). 9. Without any diagnosis of metastatic cancer Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab). 10. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list.

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		In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure. The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability. The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure;

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		2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams. The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures. For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel. The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions. The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.
Exclusions	The mortality measures exclude index admissions for patients: 1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data; 2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or 3. Discharged against medical advice (AMA). For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.	The measure excludes index admissions for patients: 1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data; 2. Discharged against medical advice (AMA); 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions within the measurement year.
Exclusion Details	1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met	1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'. Rationale: Reliable and consistent data are necessary for valid calculation of the measure. 2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data. Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care. 3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data. Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.	Rationale: The measure does not include stays for patients where the admission date is after the date of death in the Medicare Enrollment Database, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data. 2. Discharged against medical advice (AMA) Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240) Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals. 4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year. Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded. Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	*	*
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals. The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher	The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique. Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of "predicted" deaths to the number of "expected" deaths at a given hospital. The predicted number of deaths is based on the hospital's performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation's performance with that hospital's case mix and service mix

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	ratio indicates higher-than-expected mortality rates or worse quality. The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period. This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology. References: 1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.	and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix and service mix, to be compared to an average hospital's performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality. To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period. The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.
Submission items	5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization 0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05) 1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization	5.1 Identified measures: 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: This claims-only hospital-wide mortality (HWM) measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
	2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions 3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). 5b.1 If competing, why superior or rationale for additive value: N/A	procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer (with some exceptions), whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include in the HWM measure as many have survival as their primary goal; however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore, are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into, to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into five categories, or "specialty cohorts", while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. Hospital-wide mortality captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions

Measures	1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure
		(CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures. 5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

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Comparison of NQF 2993 and NQF 0022

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
Steward	National Committee for Quality Assurance	National Committee for Quality Assurance
Description	The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure: - Rate 1: The percentage of those with a history of falls that received a potentially harmful medication - Rate 2: The percentage of those with dementia that received a potentially harmful medication - Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication A lower rate represents better performance for all rates.	The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance.
Type	Process	Process
Data Source	Claims This measure is based on administrative claims collected in the course of providing care	Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system. No data collection instrument provided Attachment 2993_DDE_Fall_2020_Value_Sets.xlsx	and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system. No data collection instrument provided No data dictionary
Level	Health Plan	Health Plan
Setting	Outpatient Services	Outpatient Services
Numerator Statement	Numerator 1: Patients with a history of falls who received at least one potentially harmful medication from Table DDE-A or Table DDE-B Numerator 2: Patients with a diagnosis of dementia who received at least one potentially harmful medication from Table DDE-D Numerator 3: Patients with chronic kidney disease who received at least one potentially harmful medication from Table DDE-E	Patients who received at least two dispensing events for the same high-risk medication during the measurement year.
Numerator Details	Rate 1 numerator: Dispensed an ambulatory prescription for an anticonvulsant, SSRI, or SNRI (Table DDE-A), or antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B) on or between the index episode start date (IESD) and December 31 of the measurement year. Rate 2 numerator: Dispensed an ambulatory prescription for an antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B), or anticholinergic agent (Table DDE-D) on or between the IESD and December 31 of the measurement year. Rate 3 numerator: Dispensed an ambulatory prescription for a Cox-2 selective NSAID or	Patients who had at least two dispensing events for the same high-risk medication during the measurement year. Follow the steps below to identify numerator compliance. Include patients who meet criteria in more than one step only once in the numerator. Do not include denied claims. Step 1: Identify patients with two or more dispensing events (any days supply) on different dates of service during the measurement year for a medication in Table DAE-A. The dispensing events must be for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. Step 2: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-B. Identify patients with two or more dispensing events on different dates of service for medications in the same medication class (as defined by the AGS Beers Criteria Table 2 and class title below). For example, a prescription for zolpidem and a prescription for zaleplon are considered two dispensing events for medications in the same medication class (these drugs share the same class title or description: Nonbenzodiazepine hypnotics). Sum the days supply for prescriptions in the same medication class. Identify patients with two or more dispensing events for

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	nonaspirin NSAID (Table DDE-E) on or between the IESD and December 31 of the measurement year. Note: Do not include denied claims. Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year. For an outpatient claim/encounter, the IESD is the date of service. For an inpatient claim/encounter, the IESD is the discharge date. For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service. For dispensed prescriptions, the IESD is the dispense date. … Table DDE-A: Potentially Harmful Drugs – Rate 1 Anticonvulsants: Carbamazepine, Clobazam, Divalproex sodium, Ethosuximide, Ethotoin, Ezogabine, Felbamate, Fosphenytoin, Gabapentin, Lacosamide, Lamotrigine, Levetiracetam, Methsuximide, Oxcarbazepine, Phenobarbital, Phenytoin, Pregabalin, Primidone, Rufinamide, Tiagabine HCL, Topiramate, Valproate sodium, Valproic acid, Vigabatrin, Zonisamide SNRIs: Desvenlafaxine, Duloxetine, Levomilnacipran, Venlafaxine SSRIs: Citalopram, Escitalopram, Fluoxetine, Fluvoxamine, Paroxetine, Setraline	medications of the same medication class where the summed days supply exceeds the days supply criteria listed for the medication. These patients are numerator compliant. For medications dispensed during the measurement year sum the days supply and include any days supply that extends beyond December 31 of the measurement year. For example, a prescription of a 90-days supply dispensed on December 1 of the measurement year counts as a 90-days supply. - Note: The intent is to identify all patients who had multiple dispensing events where the summed days supply exceeds the days supply criteria; there is no requirement that each dispensing event exceed the days supply criteria. Step 3: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-C where average daily dose exceeds the average daily dose criteria listed for the medication. Identify patients with two or more dispensing events on different dates of service that exceed the average daily dose criteria for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. To calculate average daily dose for each dispensing event, multiply the quantity of pills dispensed by the dose of each pill and divide by the days supply. For example, a prescription for a 30-days supply of digoxin containing 15 pills, .250 mg each pill, has an average daily dose of 0.125 mg. To calculate average daily dose for elixirs and concentrates, multiply the volume dispensed by daily dose and divide by the days supply. Do not round when calculating average daily dose. HIGH-RISK MEDICATIONS (Table DAE-A) Anticholinergics, First-generation antihistamines--- Brompheniramine, Carbinoxamine, Chlorpheniramine, Clemastine, Cyproheptadine, Dexbrompheniramine, Dexchlorpheniramine, Diphenhydramine (oral), Dimenhydrinate, Doxylamine, Hydroxyzine, Meclizine, Promethazine, Pyrilamine, Triprolidine Anticholinergics, anti-Parkinson agents--- Benztropine (oral), Trihexyphenidyl Antispasmodics--- Atropine (exclude ophthalmic), Bellandonna alkaloids, Clidinium-Chlordiazepoxide, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine Antithrombotics--- Dipyridamole, oral short-acting (does not apply to the extended-release combination with aspirin) Cardiovascular, alpha agonists, central--- Guanabenz, Guanfacine, Methyldopa Cardiovascular, other---

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	--- Table DDE-B: Potentially Harmful Drugs – Rate 1 (History of Falls) and Rate 2 (Dementia) Antipsychotics: Aripiprazole, Asenapine, Brexpiprazole, Cariprazine, Chlorpromazine, Clozapine, Fluphenazine, Haloperidol, Iloperidone, Loxapine, Lurasidone, Molindone, Olanzapine, Paliperidone, Perphenazine, Pimozide, Quetiapine, Risperidone, Thioridazine, Thiothixene, Trifluoperazine, Ziprasidone Benzodiazepine hypnotics: Alprazolam, Chlordiazepoxide products, Clonazepam, Clorazepate-Dipotassium, Diazepam, Estazolam, Flurazepam HCL, Lorazepam, Midazolam HCL, Oxazepam, Quazepam, Temazepam, Triazolam Nonbenzodiazepine hypnotics: Eszopiclone, Zaleplon, Zolpidem Tricyclic antidepressants: Amitriptyline, Amoxapine, Clomipramine, Desipramine, Doxepin (>6 mg), Imipramine, Nortriptyline, Protriptyline, Trimipramine --- Table DDE-D: Potentially Harmful Drugs – Rate 2 (Dementia) Anticholinergic agents, antiemetics: Prochlorperazine, Promethazine Anticholinergic agents, antihistamines: Brompheniramine, Carbinoxamine, Chlorpheniramine, Hydroxyzine, Clemastine, Cyproheptadine, Pyrilamine, Triprolidine, Dimenhydrinate, Diphenhydramine, Meclizine, Dexbrompheniramine, Dexchlorpheniramine, Doxylamine	Disopyramide, Nifedipine (immediate release) Central nervous system, antidepressants--- Amitriptyline, Clomipramine, Imipramine, Trimipramine, Amoxapine, Desipramine, Nortiptyline, Paroxetine, Protriptyline Central nervous system, barbiturates--- Amobarbital, Butabarbital, Butalbital, Mephobarbital, Pentobarbital, Phenobarbital, Secobarbital Central nervous system, vasodilators--- Ergot mesylates, Isoxsuprine Central nervous system, other--- Meprobamate Endocrine system, estrogens with or without progestins; include only oral and topical patch products--- Conjugated estrogen, Esterified estrogen, Estradiol, Estropipate Endocrine system, sulfonylureas, long-duration--- Chlorpropamide, Glimepiride, Glyburide Endocrine system, other--- Desiccated thyroid, Megestrol Pain medications, skeletal muscle relaxants--- Carisoprodol, Chlorzoxazone, Cyclobenzaprine, Metaxalone, Methocarbamol, Orphenadrine Pain medications, other--- Indomethacin, Ketorolac (includes parenteral), Meperidine --- HIGH-RISK MEDICATIONS WITH DAYS SUPPLY CRITERIA (Table DAE-B) Anti-infectives, other (greater than 90 days supply, days supply criteria)--- Nitrofurantoin, Nitrofurantoin macrocrystals, Nitrofurantoin macrocrystals-monohydrate Nonbenzodiazepine hypnotics (greater than 90 days supply, days supply criteria)--- Eszopiclone, Zolpidem, Zaleplon --- HIGH-RISK MEDICATIONS WITH AVERAGE DAILY DOSE CRITERIA (Table DAE-C) Alpha agonists, central (greater than 0.1 mg/day, average daily dose criteria)---

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	Anticholinergic agents, antispasmodic: Atropine, Homatropine, Belladonna alkaloids, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine, Clidinium-chlordiazepoxide Anticholinergic agents, antimuscarinics (oral) Darifenacin, Fesoterodine, Solifenacin, Trospium, Flavoxate, Oxybutynin, Tolterodine Anticholinergic agents, anti-Parkinson agents Benztropine, Trihexyphernidyl Anticholinergic agents, skeletal muscle relaxants Cyclobenzaprine, Orphenadrine Anticholinergic agents, SSRIs: Paroxetine Anticholinergic agents, antiarrhythmic: Disopyramide --- Table DDE-E: Cox-2 Selective NSAIDs and Nonasprin NSAIDs Cox-2 Selective NSAIDs: Celecoxib Nonaspirin NSAIDs: Diclofenac potassium, Diclofenac sodium, Etodolac, Fenoprofen, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Ketorolac, Meclofenamate, Mefenamic acid, Meloxicam, Nabumetone, Naproxen, Naproxen sodium, Oxaprozin, Piroxicam, Sulindac, Tolmetin	Reserpine Cardiovascular, other (greater than 0.125 mg/day, average daily dose criteria)--- Digoxin Tertiary TCAs (as single agent or as part of combination products), (greater than 6 mg/day, average daily dose criteria)--- Doxepin --- Note: NCQA will post a comprehensive list of medications and NDC codes to www.ncqa.org by November 2020. For medications in Table DAE-A and DAE-C, identify different drugs using the Drug ID field located in the NDC list on NCQA's Web site (www.ncqa.org), posted by November 2020.
Denominator Statement	All patients 65 years of age and older with a history of falls, dementia or chronic kidney disease in the measurement year or the year prior to the measurement year.	All patients 65 years of age and older.
Denominator Details	All patients ages 67 years and older as of December 31 of the measurement year with a history of falls, dementia or chronic kidney	All patients that are 66 years of age and older as of December 31 of the measurement year.

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	disease. Each of the three rates in the measure has a different denominator: Rate 1 denominator: Patients with an accidental fall or hip fracture (Note: hip fractures are used as a proxy for identifying accidental falls). Individuals with either of the following on or between January 1 of the year prior to the measurement year and December 1 of the measurement year meet criteria: -An accidental fall (Falls Value Set). -An acute inpatient encounter (Acute Inpatient Value Set), nonacute inpatient encounter (Nonacute Inpatient Value Set), outpatient visit (Outpatient Value Set), an observation visit (Observation Value Set) or an ED visit (ED Value Set) with a hip fracture (Hip Fractures Value Set). -An acute or nonacute inpatient discharge with a hip fracture (Hip Fractures Value Set). To identify acute and nonacute inpatient discharges: 1) Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2) Identify the discharge date for the stay. 3) Identify the index episode start date (IESD) for each patient. Rate 2 denominator: Patients with a diagnosis of dementia (Dementia Value Set) or a dispensed dementia medication (Table DDE-C) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient. Rate 3 denominator: Patients with chronic kidney disease as identified by a diagnosis of ESRD (ESRD Value Set), dialysis (Dialysis Procedure Value Set), stage 4 chronic kidney disease (CKD Stage 4 Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set) on or between	

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	January 1 of the year prior to the measurement year and December 1 of the measurement year. --- Note: Patients with more than one disease or condition may appear in the measure multiple times (i.e., in each indicator for which they qualify). Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year. For an outpatient claim/encounter, the IESD is the date of service. For an inpatient claim/encounter, the IESD is the discharge date. For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service. For dispensed prescriptions, the IESD is the dispense date. See S.2.b for all Value Sets Table DDE-C: Prescriptions to Identify Members with Dementia Cholinesterase inhibitors: Donepezil, Galantamine, Rivastigmine Miscellaneous central nervous system agents: Memantine	
Exclusions	For those who meet denominator criteria for the history of falls rate (Rate 1): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder or seizure disorder. For those who meet denominator criteria for the dementia rate (Rate 2): exclude those with a	Patients who were enrolled in hospice care at any time during the measurement year.

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	diagnosis of psychosis, schizophrenia, schizoaffective disorder or bipolar disorder.	
Exclusion Details	For those who meet denominator criteria for the history of falls rate (Rate 1): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set), bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set), major depressive disorder (Major Depression or Dysthymia Value Set) or seizure disorder (Seizure Disorders Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. For those who meet denominator criteria for the dementia rate (Rate 2): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set) or bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.	*
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	No risk adjustment or risk stratification	*
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	Step 1. Determine the eligible population: All patients 67 years of age and older as of the end (i.e., December 31) of the measurement year. Step 2: Identify the denominators for each of the three rates: Rate 1: Those in the eligible population with a history of falls (see S.7 for details) on or between January 1 of the year prior to the measurement	Step 1. Determine the denominator: All patients 66 years of age and older as of the end (i.e., December 31) of the measurement year. Step 2: Identify the numerator: Individuals in the denominator who have dispensed at least two prescriptions for the same high-risk medication (see definition of high-risk medication in section S.6) during the measurement year. Step 3: Divide Step 2 (numerator) by Step 1 (denominator) to calculate the rate. Note: For this measure, a lower rate indicates better performance.

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, bipolar disorder, major depressive disorder, or seizure disorder (see S.9 for details). Identify the index episode start date (IESD) for each patient. Rate 2: Those in the eligible population with dementia (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, or bipolar disorder (see S.9 for details). Identify the IESD for each patient. Rate 3: Those in the eligible population with chronic kidney disease (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient. Step 3: Identify the numerators: Individuals in each of the denominators who have received at least one potentially harmful medication on or after the IESD (see definitions of potentially harmful medications for each numerator in section S.5). Step 4: Calculate the rates: Rate 1 – Numerator 1 divided by denominator 1. Rate 2 – Numerator 2 divided by denominator 2. Rate 3 – Numerator 3 divided by denominator 3. Note: For this measure, a lower rate indicates better performance for all three rates. Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.	

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	For an outpatient claim/encounter, the IESD is the date of service. For an inpatient claim/encounter, the IESD is the discharge date. For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service. For dispensed prescriptions, the IESD is the dispense date.	
Submission items	5.1 Identified measures: 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: The Use of High-Risk Medications in Older Adults (DAE) measure and NQF 2993 have a similar focus (measuring potentially inappropriate medication use in older adults) and reporting level (health plan), however they have different target populations. The DAE measure targets a larger population of all older adults and assesses use of high-risk medications that have been recommended to be avoided in all older adults. This measure (NQF 2993) targets patients with a specific condition or disease who can experience adverse effects when combined with certain medications that are recommended to be avoided for that condition. The DAE measure (NQF 0022) is being submitted for NQF re-endorsement during this current Patient Safety project as well. Together these measures cover a significant portion of the AGS Beers Criteria recommendations for population-level medication safety assessment.	5.1 Identified measures: 2993 : Potentially Harmful Drug-Disease Interactions in Older Adults (DDE) 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: The Potentially Harmful Drug-Disease Interactions in Older Adults (DDE) measure and NQF 0022 have a similar focus (measuring potentially inappropriate medication use in older adults) and reporting level (health plan), however they have different target populations. The DDE measure targets patients with a specific condition or disease that can experience adverse effects when combined with certain medications that are recommended to be avoided for that condition. This measure (NQF 0022) targets a larger population of all older adults and assesses use of high-risk medications that have been recommended to be avoided in all older adults. The DDE measure (NQF 2993) is being submitted for NQF re-endorsement during this current Patient Safety project as well. Together these measures cover a significant portion of the AGS Beers Criteria recommendations for population-level medication safety assessment. This measure (NQF 0022) is harmonized with PQA's Use of High-Risk Medications in the Elderly (HRM) measure. The HRM measure is also based on the AGS Beers Criteria Table 2 and targets the same population of older adults. However, CMS will retire this display measure for 2021 and no longer reports this measure in the Patient Safety reports for the 2019 measurement year. Commenters supported retiring this measure. 5b.1 If competing, why superior or rationale for additive value: N/A

Measures	2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)	0022: Use of High-Risk Medications in Older Adults (DAE)
	5b.1 If competing, why superior or rationale for additive value: N/A	

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Appendix E2: Related and Competing Measures (narrative format)

Comparison of NQF 0022 and NQF 2993

0022 Use of High-Risk Medications in Older Adults (DAE)
2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Steward

0022 Use of High-Risk Medications in Older Adults (DAE)

National Committee for Quality Assurance

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

National Committee for Quality Assurance

Description

0022 Use of High-Risk Medications in Older Adults (DAE)

The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure:

- Rate 1: The percentage of those with a history of falls that received a potentially harmful medication
- Rate 2: The percentage of those with dementia that received a potentially harmful medication
- Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication

A lower rate represents better performance for all rates.

Type

0022 Use of High-Risk Medications in Older Adults (DAE)

Process

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Process

Data Source

0022 Use of High-Risk Medications in Older Adults (DAE)

Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.

Level

0022 Use of High-Risk Medications in Older Adults (DAE)

Health Plan

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Health Plan

Setting

0022 Use of High-Risk Medications in Older Adults (DAE)

Outpatient Services

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Outpatient Services

Numerator Statement

0022 Use of High-Risk Medications in Older Adults (DAE)

Patients who received at least two dispensing events for the same high-risk medication during the measurement year.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Numerator 1: Patients with a history of falls who received at least one potentially harmful medication from Table DDE-A or Table DDE-B

Numerator 2: Patients with a diagnosis of dementia who received at least one potentially harmful medication from Table DDE-D

Numerator 3: Patients with chronic kidney disease who received at least one potentially harmful medication from Table DDE-E

Numerator Details

0022 Use of High-Risk Medications in Older Adults (DAE)

Patients who had at least two dispensing events for the same high-risk medication during the measurement year.

Follow the steps below to identify numerator compliance. Include patients who meet criteria in more than one step only once in the numerator. Do not include denied claims.

Step 1: Identify patients with two or more dispensing events (any days supply) on different dates of service during the measurement year for a medication in Table DAE-A. The dispensing events must be for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant.

Step 2: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-B. Identify patients with two or more dispensing events on different dates of service for medications in the same medication class (as defined by the AGS Beers Criteria Table 2 and class title below). For example, a prescription for zolpidem and a prescription for zaleplon are considered two dispensing events for medications in the same medication class (these drugs share the same class title or description: Nonbenzodiazepine hypnotics). Sum the days supply for prescriptions in the same medication class. Identify patients with two or more dispensing events for medications of the same medication class where the summed days supply exceeds the days supply criteria listed for the medication. These patients are numerator compliant. For medications dispensed during the measurement year sum the days supply and include any days supply that extends beyond December 31 of the measurement year. For example, a prescription of a 90-days supply dispensed on December 1 of the measurement year counts as a 90-days supply.

- Note: The intent is to identify all patients who had multiple dispensing events where the summed days supply exceeds the days supply criteria; there is no requirement that each dispensing event exceed the days supply criteria.

Step 3: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-C where average daily dose exceeds the average daily dose criteria listed for the medication. Identify patients with two or more dispensing events on different dates of service that exceed the average daily dose criteria for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. To calculate average daily dose for each dispensing event, multiply the quantity of pills dispensed by the dose of each pill and divide by the days supply. For example, a prescription for a 30-days supply of digoxin containing 15 pills, .250 mg each pill, has an average daily dose of 0.125 mg. To calculate average daily dose for elixirs and concentrates, multiply the volume dispensed by daily dose and divide by the days supply. Do not round when calculating average daily dose.

HIGH-RISK MEDICATIONS (Table DAE-A)

Anticholinergics, First-generation antihistamines---

Brompheniramine, Carbinoxamine, Chlorpheniramine, Clemastine, Cyproheptadine, Dexbrompheniramine, Dexchlorpheniramine, Diphenhydramine (oral), Dimenhydrinate, Doxylamine, Hydroxyzine, Meclizine, Promethazine, Pyrilamine, Triprolidine

Anticholinergics, anti-Parkinson agents---

Benztropine (oral), Trihexyphenidyl

Antispasmodics---

Atropine (exclude ophthalmic), Bellandonna alkaloids, Clidinium-Chlordiazepoxide, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine

Antithrombotics---

Dipyridamole, oral short-acting (does not apply to the extended-release combination with aspirin)

Cardiovascular, alpha agonists, central---

Guanabenz, Guanfacine, Methyldopa

Cardiovascular, other---

Disopyramide, Nifedipine (immediate release)

Central nervous system, antidepressants---

Amitriptyline, Clomipramine, Imipramine, Trimipramine, Amoxapine, Desipramine, Nortiptyline, Paroxetine, Protriptyline

Central nervous system, barbiturates---

Amobarbital, Butabarbital, Butalbital, Mephobarbital, Pentobarbital, Phenobarbital, Secobarbital

Central nervous system, vasodilators---

Ergot mesylates, Isoxsuprine

Central nervous system, other---

Meprobamate

Endocrine system, estrogens with or without progestins; include only oral and topical patch products---

Conjugated estrogen, Esterified estrogen, Estradiol, Estropipate

Endocrine system, sulfonylureas, long-duration---

Chlorpropamide, Glimepiride, Glyburide

Endocrine system, other---

Desiccated thyroid, Megestrol

Pain medications, skeletal muscle relaxants---

Carisoprodol, Chlorzoxazone, Cyclobenzaprine, Metaxalone, Methocarbamol, Orphenadrine

Pain medications, other---

Indomethacin, Ketorolac (includes parenteral), Meperidine

HIGH-RISK MEDICATIONS WITH DAYS SUPPLY CRITERIA (Table DAE-B)

Anti-infectives, other (greater than 90 days supply, days supply criteria)---

Nitrofurantoin, Nitrofurantoin macrocrystals, Nitrofurantoin macrocrystals-monohydrate

Nonbenzodiazepine hypnotics (greater than 90 days supply, days supply criteria)---

Eszopiclone, Zolpidem, Zaleplon

HIGH-RISK MEDICATIONS WITH AVERAGE DAILY DOSE CRITERIA (Table DAE-C)

Alpha agonists, central (greater than 0.1 mg/day, average daily dose criteria)---

Reserpine

Cardiovascular, other (greater than 0.125 mg/day, average daily dose criteria)---

Digoxin

Tertiary TCAs (as single agent or as part of combination products), (greater than 6 mg/day, average daily dose criteria)---

Doxepin

Note: NCQA will post a comprehensive list of medications and NDC codes to www.ncqa.org by November 2020. For medications in Table DAE-A and DAE-C, identify different drugs using the Drug ID field located in the NDC list on NCQA's Web site (www.ncqa.org), posted by November 2020.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Rate 1 numerator: Dispensed an ambulatory prescription for an anticonvulsant, SSRI, or SNRI (Table DDE-A), or antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B) on or between the index episode start date (IESD) and December 31 of the measurement year.

Rate 2 numerator: Dispensed an ambulatory prescription for an antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B), or anticholinergic agent (Table DDE-D) on or between the IESD and December 31 of the measurement year.

Rate 3 numerator: Dispensed an ambulatory prescription for a Cox-2 selective NSAID or nonaspirin NSAID (Table DDE-E) on or between the IESD and December 31 of the measurement year.

Note: Do not include denied claims.

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

…

Table DDE-A: Potentially Harmful Drugs – Rate 1

Anticonvulsants:

Carbamazepine, Clobazam, Divalproex sodium, Ethosuximide, Ethotoin, Ezogabine, Felbamate, Fosphenytoin, Gabapentin, Lacosamide, Lamotrigine, Levetiracetam, Methsuximide, Oxcarbazepine, Phenobarbital, Phenytoin, Pregabalin, Primidone, Rufinamide, Tiagabine HCL, Topiramate, Valproate sodium, Valproic acid, Vigabatrin, Zonisamide

SNRIs:

Desvenlafaxine, Duloxetine, Levomilnacipran, Venlafaxine

SSRIs:

Citalopram, Escitalopram, Fluoxetine, Fluvoxamine, Paroxetine, Setraline

---

Table DDE-B: Potentially Harmful Drugs – Rate 1 (History of Falls) and Rate 2 (Dementia)

Antipsychotics:

Aripiprazole, Asenapine, Brexpiprazole, Cariprazine, Chlorpromazine, Clozapine, Fluphenazine, Haloperidol, Iloperidone, Loxapine, Lurasidone, Molindone, Olanzapine, Paliperidone, Perphenazine, Pimozide, Quetiapine, Risperidone, Thioridazine, Thiothixene, Trifluoperazine, Ziprasidone

Benzodiazepine hypnotics:

Alprazolam, Chlordiazepoxide products, Clonazepam, Clorazepate-Dipotassium, Diazepam, Estazolam, Flurazepam HCL, Lorazepam, Midazolam HCL, Oxazepam, Quazepam, Temazepam, Triazolam

Nonbenzodiazepine hypnotics:

Eszopiclone, Zaleplon, Zolpidem

Tricyclic antidepressants:

Amitriptyline, Amoxapine, Clomipramine, Desipramine, Doxepin (>6 mg), Imipramine, Nortriptyline, Protriptyline, Trimipramine

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Table DDE-D: Potentially Harmful Drugs – Rate 2 (Dementia)

Anticholinergic agents, antiemetics:

Prochlorperazine, Promethazine

Anticholinergic agents, antihistamines:

Brompheniramine, Carbinoxamine, Chlorpheniramine, Hydroxyzine, Clemastine, Cyproheptadine, Pyrilamine, Triprolidine, Dimenhydrinate, Diphenhydramine, Meclizine, Dexbrompheniramine, Dexchlorpheniramine, Doxylamine

Anticholinergic agents, antispasmodic:

Atropine, Homatropine, Belladonna alkaloids, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine, Clidinium-chlordiazepoxide

Anticholinergic agents, antimuscarinics (oral)

Darifenacin, Fesoterodine, Solifenacin, Trospium, Flavoxate, Oxybutynin, Tolterodine

Anticholinergic agents, anti-Parkinson agents

Benztropine, Trihexyphernidyl

Anticholinergic agents, skeletal muscle relaxants

Cyclobenzaprine, Orphenadrine

Anticholinergic agents, SSRIs:

Paroxetine

Anticholinergic agents, antiarrhythmic:

Disopyramide

Table DDE-E: Cox-2 Selective NSAIDs and Nonasprin NSAIDs

Cox-2 Selective NSAIDs:

Celecoxib

Nonaspirin NSAIDs:

Diclofenac potassium, Diclofenac sodium, Etodolac, Fenoprofen, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Ketorolac, Meclofenamate, Mefenamic acid, Meloxicam, Nabumetone, Naproxen, Naproxen sodium, Oxaprozin, Piroxicam, Sulindac, Tolmetin

Denominator Statement

0022 Use of High-Risk Medications in Older Adults (DAE)

All patients 65 years of age and older.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

All patients 65 years of age and older with a history of falls, dementia or chronic kidney disease in the measurement year or the year prior to the measurement year.

Denominator Details

0022 Use of High-Risk Medications in Older Adults (DAE)

All patients that are 66 years of age and older as of December 31 of the measurement year.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

All patients ages 67 years and older as of December 31 of the measurement year with a history of falls, dementia or chronic kidney disease. Each of the three rates in the measure has a different denominator:

Rate 1 denominator: Patients with an accidental fall or hip fracture (Note: hip fractures are used as a proxy for identifying accidental falls). Individuals with either of the following on or between January 1 of the year prior to the measurement year and December 1 of the measurement year meet criteria:

- An accidental fall (Falls Value Set).
- An acute inpatient encounter (Acute Inpatient Value Set), nonacute inpatient encounter (Nonacute Inpatient Value Set), outpatient visit (Outpatient Value Set), an observation visit (Observation Value Set) or an ED visit (ED Value Set) with a hip fracture (Hip Fractures Value Set).
- An acute or nonacute inpatient discharge with a hip fracture (Hip Fractures Value Set). To identify acute and nonacute inpatient discharges: 1) Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2) Identify the discharge date for the stay. 3) Identify the index episode start date (IESD) for each patient.

Rate 2 denominator: Patients with a diagnosis of dementia (Dementia Value Set) or a dispensed dementia medication (Table DDE-C) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient.

Rate 3 denominator: Patients with chronic kidney disease as identified by a diagnosis of ESRD (ESRD Value Set), dialysis (Dialysis Procedure Value Set), stage 4 chronic kidney disease (CKD Stage 4 Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

Note: Patients with more than one disease or condition may appear in the measure multiple times (i.e., in each indicator for which they qualify).

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

See S.2.b for all Value Sets

Table DDE-C: Prescriptions to Identify Members with Dementia

Cholinesterase inhibitors:

Donepezil, Galantamine, Rivastigmine

Miscellaneous central nervous system agents:

Memantine

Exclusions

0022 Use of High-Risk Medications in Older Adults (DAE)

Patients who were enrolled in hospice care at any time during the measurement year.

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

For those who meet denominator criteria for the history of falls rate (Rate 1): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder or seizure disorder.

For those who meet denominator criteria for the dementia rate (Rate 2): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder or bipolar disorder.

Exclusion Details

0022 Use of High-Risk Medications in Older Adults (DAE)

N/A

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

For those who meet denominator criteria for the history of falls rate (Rate 1): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set), bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set), major depressive disorder (Major Depression or Dysthymia Value Set) or seizure disorder (Seizure Disorders Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For those who meet denominator criteria for the dementia rate (Rate 2): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set) or bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

Risk Adjustment

0022 Use of High-Risk Medications in Older Adults (DAE)

No risk adjustment or risk stratification

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

No risk adjustment or risk stratification

Stratification

0022 Use of High-Risk Medications in Older Adults (DAE)

N/A

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

No risk adjustment or risk stratification

Type Score

0022 Use of High-Risk Medications in Older Adults (DAE)

Rate/proportion better quality = lower score

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Rate/proportion better quality = lower score

Algorithm

0022 Use of High-Risk Medications in Older Adults (DAE)

Step 1. Determine the denominator: All patients 66 years of age and older as of the end (i.e., December 31) of the measurement year.

Step 2: Identify the numerator: Individuals in the denominator who have dispensed at least two prescriptions for the same high-risk medication (see definition of high-risk medication in section S.6) during the measurement year.

Step 3: Divide Step 2 (numerator) by Step 1 (denominator) to calculate the rate.

Note: For this measure, a lower rate indicates better performance. 123834| 140881| 150289

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Step 1. Determine the eligible population: All patients 67 years of age and older as of the end (i.e., December 31) of the measurement year.

Step 2: Identify the denominators for each of the three rates:

Rate 1: Those in the eligible population with a history of falls (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, bipolar disorder, major depressive disorder, or seizure disorder (see S.9 for details). Identify the index episode start date (IESD) for each patient.

Rate 2: Those in the eligible population with dementia (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, or bipolar disorder (see S.9 for details). Identify the IESD for each patient.

Rate 3: Those in the eligible population with chronic kidney disease (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient.

Step 3: Identify the numerators: Individuals in each of the denominators who have received at least one potentially harmful medication on or after the IESD (see definitions of potentially harmful medications for each numerator in section S.5).

Step 4: Calculate the rates:

Rate 1 – Numerator 1 divided by denominator 1.

Rate 2 – Numerator 2 divided by denominator 2.

Rate 3 – Numerator 3 divided by denominator 3.

Note: For this measure, a lower rate indicates better performance for all three rates.

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date. 123834| 150289

Submission items

0022 Use of High-Risk Medications in Older Adults (DAE)

1100 13th Street, NW, Suite 1000

Washington, DC 20005

2993 Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

1100 13th Street, NW, Third Floor

Washington, DC 20005

Comparison of NQF 0097 and NQF 0419e

0097: Medication Reconciliation Post-Discharge

0419e: Documentation of Current Medications in the Medical Record

Steward

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

0419e: Documentation of Current Medications in the Medical Record

Centers for Medicare & Medicaid Services

Description

0097: Medication Reconciliation Post-Discharge

The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

0419e: Documentation of Current Medications in the Medical Record

For both the 2018 claims and registry specifications AND the 2019 performance period eMeasure (v8) the measure description is as follows:

Percentage of visits for patients aged 18 years and older for which the eligible professional or eligible clinician attests to documenting a list of current medications using all immediate resources available on the date of the encounter. This list must include ALL known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency and route of administration.

Type

0097: Medication Reconciliation Post-Discharge

Process

0419e: Documentation of Current Medications in the Medical Record

Process

Data Source

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx

0419e: Documentation of Current Medications in the Medical Record

Claims, Electronic Health Records, Registry Data The data source is the medical record, which provides patient information for the encounter; Medicare Part B Claims and Registry data, and EHR reports.

No data collection instrument provided Attachment CMS68_QI130_NQF0419_NQF_AU_2018_S_2b__Code_Table_121218.xlsx

Level

0097: Medication Reconciliation Post-Discharge

Health Plan

0419e: Documentation of Current Medications in the Medical Record

Clinician : Group/Practice, Clinician : Individual

Setting

0097: Medication Reconciliation Post-Discharge

Outpatient Services

0419e: Documentation of Current Medications in the Medical Record

Outpatient Services

Numerator Statement

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

0419e: Documentation of Current Medications in the Medical Record

Numerator statements for both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8) is as follows:

Eligible professional or eligible clinician attests to documenting, updating, or reviewing the patient´s current medications using all immediate resources available on the date of the encounter. This list must include ALL prescriptions, over-the counters, herbals, vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosages, frequency, and route of administration.

Numerator Details

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

This measure is specified for medical record or administrative data collection.

Medical Record Reporting Details:

Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.
- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the patient's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Administrative Reporting Method Details:

See value sets provided for administrative codes meeting measure numerator intent.

0419e: Documentation of Current Medications in the Medical Record

2018 claims and registry specifications: The numerator Quality-Data Coding Options for Reporting Satisfactorily:

Current Medications Documented

Performance Met: G8427: Eligible clinician attests to documenting in the medical record they obtained, updated, or reviewed the patient's current medications.

OR

Current Medications not Documented, Patient not Eligible

Denominator Exception: G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician

OR

Current Medications with Name, Dosage, Frequency, or Route not Documented, Reason not Given.

Performance Not Met: G8428: Current list of medications not documented as obtained, updated, or reviewed by the eligible professional, reason not given.

Definitions include:

Current Medications – Medications the patient is presently taking including all prescriptions, over-the-counters, herbals and vitamin/mineral/dietary (nutritional) supplements with each medication's name, dosage, frequency and administered route.

Route – Documentation of the way the medication enters the body (some examples include but are not limited to: oral, sublingual, subcutaneous injections, and/or topical).

Within the 2019 performance period eMeasure (v8), the numerator is defined as:

"Medications Documented During Qualifying Encounter":

"Qualifying Encounters During Measurement Period" QualifyingEncounterDuringMeasurementPeriod

with ["Procedure, Performed": "Documentation of current medications (procedure)"] MedicationsDocumented such that MedicationsDocumented.relevantPeriod during QualifyingEncounterDuringMeasurementPeriod.relevantPeriod

SNOMED-CT code (428191000124101) is used to capture the numerator.

Denominator Statement

0097: Medication Reconciliation Post-Discharge

All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

0419e: Documentation of Current Medications in the Medical Record

Denominator statement for the 2018 claims and registry specifications is as follows: "All visits for patients aged 18 years and older."

Denominator statement for the 2019 performance period eMeasure (v8) is "Equals Initial Population". Initial Population is defined as: "All visits occurring during the 12 month measurement period for patients aged 18 years and older."

Denominator Details

0097: Medication Reconciliation Post-Discharge

To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

To identify nonacute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

Additional guidance for identifying appropriate discharges for inclusion in the eligible population:

- If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December
    1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.

Additional guidance for identifying the eligible population:

Patients in hospice are removed from the eligible population.

0419e: Documentation of Current Medications in the Medical Record

For the purposes of defining the denominator in both the claims and registry and eMeasure versions, the denominator is defined by the patient's age (based on patient's date of birth), encounter date, denominator CPT or HCPCS codes.

2018 claims and registry specifications:

Denominator Criteria (Eligible Cases): Patients aged >= 18 years on date of encounter

AND

Patient encounter during the reporting period (CPT or HCPCS): 59400, 59510, 59610, 59618, 90791, 90792, 90832, 90834, 90837, 90839, 92002, 92004, 92012, 92014, 92507, 92508, 92526, 92537, 92538, 92540, 92541, 92542, 92544, 92545, 92547, 92548, 92550, 92557, 92567, 92568, 92570, 92585, 92588, 92626, 96116, 96150, 96151, 96152, 97127*, 97161, 97162, 97163, 97164, 97165, 97166, 97167, 97168, 97802, 97803, 97804, 98960, 98961, 98962, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99221, 99222, 99223, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99281, 99282, 99283, 99284, 99285, 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, G0101, G0108, G0270, G0402, G0438, G0439 [*Signifies that this CPT Category I code is a non-covered service under the PFS (Physician Fee Schedule). These non-covered services will not be counted in the denominator population for claims-based measures.]

Within the 2019 performance period eMeasure (v8), the denominator is defined as the initial population where:

"Qualifying Encounters During Measurement Period" QualifyingEncounter where "Patient Age 18 or Older at Start of Measurement Period"

The eMeasure denominator includes the above CPT and HCPCS codes as well as SNOMED-CT codes in the Medications Encounter Code Set Grouping Value set OID: 2.16.840.1.113883.3.600.1.1834.

Exclusions

0097: Medication Reconciliation Post-Discharge

No exclusions.

0419e: Documentation of Current Medications in the Medical Record

Denominator exception for the 2018 claims and registry specifications is as follows:

A patient is not eligible if the following reason is documented: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status on the date of the encounter

Denominator exception for the 2019 performance period eMeasure (v8) is as follows:

Medical Reason: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status

Exclusion Details

0097: Medication Reconciliation Post-Discharge

N/A

0419e: Documentation of Current Medications in the Medical Record

2018 claims and registry specifications:

Current Medications not Documented, Patient not Eligible

Denominator Exception G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician.

Within the 2019 performance period eMeasure (v8), the denominator exception is defined as:

"Qualifying Encounters During Measurement Period" EncounterDuringMeasurementPeriod

with "Medications Not Documented for Medical Reason" MedicationsNotDocumented

such that MedicationsNotDocumented.authorDatetime during EncounterDuringMeasurementPeriod.relevantPeriod

The eMeasure denominator exception includes codes in the value set Medical or Other reason not done SNOMED-CT Value Set OID 2.16.840.1.113883.3.600.1.1502 to capture the denominator exception.

Risk Adjustment

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

0419e: Documentation of Current Medications in the Medical Record

No risk adjustment or risk stratification

Stratification

0097: Medication Reconciliation Post-Discharge

N/A

0419e: Documentation of Current Medications in the Medical Record

This measure is not stratified.

Type Score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

0419e: Documentation of Current Medications in the Medical Record

Rate/proportion better quality = higher score

Algorithm

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.

0419e: Documentation of Current Medications in the Medical Record

For both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8), the performance calculation is as follows:

PERFORMANCE CALCULATION

To calculate provider performance, complete a fraction with the following measure components:

Numerator (A), Denominator (D), and Denominator Exceptions (C)

Numerator (A): Number of visits meeting numerator criteria

Denominator (D): Number of visits meeting criteria for denominator inclusion

Denominator Exceptions (C): Number of visits not meeting numerator criteria with valid exceptions

The method of performance calculation is determined by the following:

1) identify the visits that meet the eligibility criteria for the denominator (D) which includes patients who are 18 years and older with appropriate encounters as defined by encounter codes or encounter value set during the reporting period.
2) identify which visits meet the numerator criteria (A)

3) for those visits who do not meet the numerator criteria, determine whether an appropriate exception applies (C) and subtract those visits from the denominator with the following calculation:

Numerator (A)/[Denominator (D)– Denominator Exceptions (C)]

Submission items

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record

0553 : Care for Older Adults (COA) – Medication Review

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

3317 : Medication Reconciliation on Admission

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+.

Related Measures:

Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for

documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing.

Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.

0419e: Documentation of Current Medications in the Medical Record

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0553 : Care for Older Adults (COA) – Medication Review

0554 : Medication Reconciliation Post-Discharge (MRP)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: NQF 0553 is the most similar conceptually to NQF 0419. NQF 0553 is a process measure that focuses solely on the elderly population (namely, those 66 years and older) and requires evidence of at least one medication review during the entire measurement year. Our measure (NQF 0419) encompasses a larger population (all adults 18 years of age and older) and requires a medication review at every encounter. Unlike NQF 0419, there is no e Measure available for NQF 0553. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0554 is a process measure focused on the elderly population (namely, those 66 years and older) that requires medication reconciliation within 30 days for patients discharged from the hospital. NQF 0419 is different from this measure in the following ways: (1) the population focus for NQF 0419 is inclusive of all patients 18 years and older, not just those 66 years and older discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0554 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of

medication discrepancies and is more likely to prevent adverse drug events. NQF 0097 is a process measure that reflects follow-up care following discharge from an inpatient setting for patients aged 18 years and older (performance is stratified into two age groups: patients 18-65 and patients 65 and older) who are discharged from any inpatient facility. This measure requires that medication reconciliation be conducted if the patient is seen within 30 days of discharge following an inpatient hospitalization. NQF 0097 is only reported if a patient receives follow-up care within 30 days following discharge from any inpatient setting. NQF 0419 is different from this measure in the following ways: (1) the population of focus for NQF 0419 is inclusive of all patients 18 years and older, not just those discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0419 is appropriate for reporting by any EP and must be reported for every eligible encounter. Lastly, NQF 0097 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events.

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 0097 and NQF 0553

0097: Medication Reconciliation Post-Discharge

0553: Care for Older Adults (COA) – Medication Review

Steward

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

0553: Care for Older Adults (COA) – Medication Review

National Committee for Quality Assurance

Description

0097: Medication Reconciliation Post-Discharge

The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

0553: Care for Older Adults (COA) – Medication Review

Percentage of adults 65 years and older who had a medication review during the measurement year. A medication review is a review of all a patient's medications, including prescription medications, over-the-counter (OTC) medications and herbal or supplemental therapies by a prescribing practitioner or clinical pharmacist.

Type

0097: Medication Reconciliation Post-Discharge

Process

0553: Care for Older Adults (COA) – Medication Review

Process

Data Source

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx

0553: Care for Older Adults (COA) – Medication Review

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from health plans via NCQA's online data submission system.

No data collection instrument provided Attachment 0553_COA_Med_Review_Value_Sets.xlsx

Level

0097: Medication Reconciliation Post-Discharge

Health Plan

0553: Care for Older Adults (COA) – Medication Review

Health Plan

Setting

0097: Medication Reconciliation Post-Discharge

Outpatient Services

0553: Care for Older Adults (COA) – Medication Review

Outpatient Services

Numerator Statement

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

0553: Care for Older Adults (COA) – Medication Review

At least one medication review conducted by a prescribing practitioner or clinical pharmacist during the measurement year and the presence of a medication list in the medical record.

Numerator Details

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

This measure is specified for medical record or administrative data collection.

Medical Record Reporting Details:

Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.
- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the patient's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Administrative Reporting Method Details:

See value sets provided for administrative codes meeting measure numerator intent.

0553: Care for Older Adults (COA) – Medication Review

This measure can be met using the administrative specification (using administrative claims codes) or the hybrid specification (using administrative claims codes and medical record review).

Administrative: Either of the following meet criteria:

- Both of the following during the same visit during the measurement year where the provider type is a prescribing practitioner or clinical pharmacist:
  - At least one medication review (Medication Review Value Set).
  - The presence of a medication list in the medical record (Medication List Value Set).
- Transitional care management services (Transitional Care Management Services Value Set).

Exclude services provided in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set).

(See corresponding Excel document for the value sets referenced above.)

Hybrid: Documentation must come from the same medical record and must include one of the following:

- A medication list in the medical record, and evidence of a medication review by a prescribing practitioner or clinical pharmacist and the date when it was performed.
- Notation that the member is not taking any medication and the date when it was noted.

A review of side effects for a single medication at the time of prescription alone is not sufficient. An outpatient visit is not required to meet criteria. Do not include medication lists or medication reviews performed in an acute inpatient setting.

Prescribing practitioner is defined as a practitioner with prescribing privileges, including nurse practitioners, physician assistants and other non-MDs who have the authority to prescribe medications.

Denominator Statement

0097: Medication Reconciliation Post-Discharge

All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

0553: Care for Older Adults (COA) – Medication Review

All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Denominator Details

0097: Medication Reconciliation Post-Discharge

To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

To identify nonacute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

Additional guidance for identifying appropriate discharges for inclusion in the eligible population:

- If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.

Additional guidance for identifying the eligible population:

Patients in hospice are removed from the eligible population.

0553: Care for Older Adults (COA) – Medication Review

Use administrative data to identify all patients 66 years and older as of the end of the measurement year.

Exclusions

0097: Medication Reconciliation Post-Discharge

No exclusions.

0553: Care for Older Adults (COA) – Medication Review

Exclude members who use hospice services.

Exclusion Details

0097: Medication Reconciliation Post-Discharge

N/A

0553: Care for Older Adults (COA) – Medication Review

Exclude members who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began. These members may be identified using various methods, which may include but are not limited to enrollment data, medical record or claims/encounter data (Hospice Value Set).

Risk Adjustment

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

0553: Care for Older Adults (COA) – Medication Review

No risk adjustment or risk stratification

Stratification

0097: Medication Reconciliation Post-Discharge

N/A

0553: Care for Older Adults (COA) – Medication Review

N/A

Type Score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

0553: Care for Older Adults (COA) – Medication Review

Rate/proportion better quality = higher score

Algorithm

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.

0553: Care for Older Adults (COA) – Medication Review

Step 1. Determine the eligible population: All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Step 2: Identify the denominator: Exclude any patients who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began.

The remainder is the eligible population

Step 3: Identify the numerator: Individuals in the denominator who have documentation of at least one medication review conducted by a prescribing practitioner or clinical pharmacist and have a medication list in their medical record.

Step 4: Calculate the rate: Numerator/Denominator

Submission items

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record

0553 : Care for Older Adults (COA) – Medication Review

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

3317 : Medication Reconciliation on Admission

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+.

Related Measures:

Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing.

Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-

counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.

0553: Care for Older Adults (COA) – Medication Review

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0419 : Documentation of Current Medications in the Medical Record

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

3317 : Medication Reconciliation on Admission

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See response in 5b.1 (response would not fit in this text box).

5b.1 If competing, why superior or rationale for additive value: ANSWER TO 5A.1:

NCQA is committed to harmonization across measures and reducing unnecessary burden in measurement. However, it is important to note that the numerator (the specific health care service) being reported in this measure (Measure 0553) differs from many of the other related measures.

Measures 0097, 2456, 3317, and 2988 address MEDICATION RECONCILIATION, which is a care service that includes compiling a list of medications the patient is currently taking and comparing it against a second list (generally a physician's admission, transfer, and/or discharge orders) in order to reconcile discrepancies between the two lists and make sure the patient is prescribed the appropriate medications and to decrease the likelihood of adverse medication interactions.

This care service is different from a MEDICATION REVIEW, which is the focus of this submission (Measure 0553). In a medication review, the goal is a critical examination of all the medications a patient is taking with the objective of reaching an agreement with the patient about treatment, optimizing the impact of medicine, and minimizing medication-related problems.

A medication review is also different from a simple documentation of current medications in the medical record (the focus of Measure 0419e), because this measure involves a review of medications in addition to a documentation of the patient's medications in the medical record.

Additional differences among the measures include level of accountability and target population, as demonstrated below:

0053: Care for Older Adults – Medication Review

Level of accountability: Health plan

Target population: Older adults (age 65 years and older)

0097: Medication Reconciliation Post Discharge

Level of accountability: Health plan

Target population: Adults 18+ discharged from hospital

0419e: Documentation of Current Medications in the Medical Record

Level of accountability: Individual clinician

Target population: Adults 18+

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Level of accountability: Facility (hospital)

Target population: Adults 18+ discharged from hospital

3317: Medication Reconciliation on Admission

Level of accountability: Facility (hospital)

Target population: Adults 18+ admitted to hospital

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Level of accountability: Facility (dialysis facility)

Target population: Adults permanently assigned to a dialysis facility

Evidence of performance gap and relation to risk of adverse events:

- Many medication errors occur during times of transition, when patients receive medications from different prescribers who lack access to patients' comprehensive medication list. Conducting medication reconciliation at major care transitions (eg, upon admission, upon discharge) may improve patients' ability to manage their medication regimen properly and reduce the number of medication errors (Measures #0097, 2456, 3317, 2988).
- Older adults are a vulnerable population and are more likely to have multiple comorbid conditions and thus be receiving multiple medications. This places them at higher risk of an adverse medication event, even without a care transition. This supports an annual medication review targeted specifically to older adults (Measure #0053). This measure is more specifically targeted to a vulnerable population and less burdensome to providers than a medication list documented at every medical visit (Measure #0419e).

ANSWER TO 5b.1:

While the other measures generally address a similar focus (medications), no other NQF-endorsed measures address both the same measure focus AND the same target population.

Comparison of NQF 0097 and NQF 2456

0097: Medication Reconciliation Post-Discharge

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Steward

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Brigham and Women's Hospital

Description

0097: Medication Reconciliation Post-Discharge

The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

Type

0097: Medication Reconciliation Post-Discharge

Process

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Outcome

Data Source

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

Level

0097: Medication Reconciliation Post-Discharge

Health Plan

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Facility

Setting

0097: Medication Reconciliation Post-Discharge

Outpatient Services

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Inpatient/Hospital

Numerator Statement

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

Numerator Details

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

This measure is specified for medical record or administrative data collection.

Medical Record Reporting Details:

Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.
- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the patient's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Administrative Reporting Method Details:

See value sets provided for administrative codes meeting measure numerator intent.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

First, a "gold-standard" preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team's documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team's preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team's preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

Denominator Statement

0097: Medication Reconciliation Post-Discharge

All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be 75/150 = 0.5 discrepancies per medication per patient for that hospital for that month.

Denominator Details

0097: Medication Reconciliation Post-Discharge

To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

To identify nonacute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

Additional guidance for identifying appropriate discharges for inclusion in the eligible population:

- If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.

Additional guidance for identifying the eligible population:

Patients in hospice are removed from the eligible population.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

Exclusions

0097: Medication Reconciliation Post-Discharge

No exclusions.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

Exclusion Details

0097: Medication Reconciliation Post-Discharge

N/A

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Please see exclusion listed above.

Risk Adjustment

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

No risk adjustment or risk stratification

Stratification

0097: Medication Reconciliation Post-Discharge

N/A

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

Type Score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

Continuous variable, e.g. average better quality = lower score

Algorithm

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation)

Submission items

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record

0553 : Care for Older Adults (COA) – Medication Review

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

3317 : Medication Reconciliation on Admission

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+.

Related Measures:

Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not

required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing.

Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to "check a box" documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these

documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 0097 and NQF 2988

0097: Medication Reconciliation Post-Discharge

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Steward

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Kidney Care Quality Alliance (KCQA)

Description

0097: Medication Reconciliation Post-Discharge

The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Percentage of patient-months for which medication reconciliation* was performed and documented by an eligible professional.**

* “Medication reconciliation” is defined as the process of creating the most accurate list of all home medications that the patient is taking, including name, indication, dosage, frequency, and route, by comparing the most recent medication list in the dialysis medical record to one or more external list(s) of medications obtained from a patient or caregiver (including patient-/caregiver-provided “brown bag” information), pharmacotherapy information network (e.g., Surescripts), hospital, or other provider.

** For the purposes of medication reconciliation, “eligible professional” is defined as: physician, RN, ARNP, PA, pharmacist, or pharmacy technician.

Type

0097: Medication Reconciliation Post-Discharge

Process

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Process

Data Source

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Electronic Health Data, Other Dialysis facility medical record; intended for use by CMS in its CROWNWeb ESRD Clinical Data Repository.

No data collection instrument provided No data dictionary

Level

0097: Medication Reconciliation Post-Discharge

Health Plan

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Facility

Setting

0097: Medication Reconciliation Post-Discharge

Outpatient Services

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Post-Acute Care

Numerator Statement

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Number of patient-months for which medication reconciliation was performed and documented by an eligible professional during the reporting period.

The medication reconciliation MUST:

- Include the name or other unique identifier of the eligible professional;

AND

- Include the date of the reconciliation;

AND

- Address ALL known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana);

AND

- Address for EACH home medication: Medication name(1), indication(2), dosage(2), frequency(2), route of administration(2), start and end date (if applicable)(2), discontinuation date (if applicable)(2), reason medication was stopped or discontinued (if applicable)(2), and identification of individual who authorized stoppage or discontinuation of medication (if applicable)(2);

AND

- List any allergies, intolerances, or adverse drug events experienced by the patient.

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1. For patients in a clinical trial, it is acknowledged that it may be unknown as to whether the patient is receiving the therapeutic agent or a placebo.
2. "Unknown" is an acceptable response for this field.

Numerator Details

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

This measure is specified for medical record or administrative data collection.

Medical Record Reporting Details:

Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.

- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the patient's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Administrative Reporting Method Details:

See value sets provided for administrative codes meeting measure numerator intent.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

NUMERATOR STEP 1. For each patient meeting the denominator criteria in the given calculation month, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:

A. Facility attestation that during the calculation month:

1. The patient's most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided "brown-bag" information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;

AND

2. ALL of the following items were addressed for EACH identified medication:

a) Medication name;
b) Indication (or "unknown");
c) Dosage (or "unknown");
d) d)Frequency (or "unknown");
e) Route of administration (or "unknown");
f) Start date (or "unknown");
g) End date, if applicable (or "unknown");

h) Discontinuation date, if applicable (or "unknown");
i) Reason medication was stopped or discontinued, if applicable (or "unknown"); and
j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or "unknown");

AND

3. Allergies, intolerances, and adverse drug events were addressed and documented.

B. Date of the medication reconciliation.

C. Identity of eligible professional performing the medication reconciliation.

NUMERATOR STEP 2. Repeat "Numerator Step 1" for each month of the one-year reporting period to define the final numerator (patient-months).

Denominator Statement

0097: Medication Reconciliation Post-Discharge

All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Total number of patient-months for all patients permanently assigned to a dialysis facility during the reporting period.

Denominator Details

0097: Medication Reconciliation Post-Discharge

To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

To identify nonacute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

Additional guidance for identifying appropriate discharges for inclusion in the eligible population:

- If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.

Additional guidance for identifying the eligible population:

Patients in hospice are removed from the eligible population.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

DENOMINATOR STEP 1. Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility in the given calculation month.

DENOMINATOR STEP 2. For all patients included in the denominator in the given calculation month in "Denominator Step 1", identify and remove all in-center hemodialysis patients who received < 7 dialysis treatments in the calculation month.

DENOMINATOR STEP 3. Repeat "Denominator Step 1" and "Denominator Step 2" for each month of the one-year reporting period.

Exclusions

0097: Medication Reconciliation Post-Discharge

No exclusions.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

In-center patients who receive <7 hemodialysis treatments in the facility during the reporting month.

Exclusion Details

0097: Medication Reconciliation Post-Discharge

N/A

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

As detailed in "Denominator Step 2" above, transient patients, defined as in-center patients who receive <7 hemodialysis treatments in the facility during the reporting month, are excluded from the measure.

Risk Adjustment

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

No risk adjustment or risk stratification

Stratification

0097: Medication Reconciliation Post-Discharge

N/A

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Not applicable.

Type Score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Rate/proportion better quality = higher score

Algorithm

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Scores are calculated using the following algorithm. For each calculation month in the one-year reporting period:

1. IDENTIFY THE "RAW DENOMINATOR POPULATION"

Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility during the given calculation month.

2. REMOVE PATIENTS MEETING MEASURE EXCLUSION CRITERIA TO DEFINE THE "FINAL DENOMINATOR POPULATION" FOR THE CALCULATION MONTH

For all patients included in the denominator during the given calculation month in Step 1 above, identify and remove all in-center patients who received < 7 hemodialysis treatments during the given calculation month.

3. IDENTIFY THE "NUMERATOR POPULATION" FOR THE CALCULATION MONTH

For each patient remaining in the denominator during the given calculation month after Step 2, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:

A. Facility attestation that during the calculation month:

1. The patient's most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided "brown-bag" information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;

AND

2. ALL of the following items were addressed for EACH identified medication:

a) Medication name;
b) Indication (or "unknown");
c) Dosage (or "unknown");
d) Frequency (or "unknown");
e) Route of administration (or "unknown");
f) Start date (or "unknown");

g) End date, if applicable (or “unknown”);
h) Discontinuation date, if applicable (or “unknown”);
i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and
j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”);

AND

3. Allergies, intolerances, and adverse drug events were addressed and documented.

B. Date of medication reconciliation.
C. Identity of eligible professional performing medication reconciliation.

4. CALCULATE THE PERFORMANCE SCORE FOR THE CALCULATION MONTH

Calculate the facility’s performance score for the given calculation month as follows:

Month’s Performance Score = Month’s Final Numerator Population ÷ Month’s Final Denominator Population

5. CALCULATE THE ANNUAL PERFORMANCE SCORE

Calculate the facility’s annual performance score as follows:

Facility’s Annual Performance Score = (Facility’s Month 1 Score + Month 2 Score +..... + Month 12 Score) ÷ 12

Submission items

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record

0553 : Care for Older Adults (COA) – Medication Review

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

3317 : Medication Reconciliation on Admission

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+.

Related Measures:

Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not

required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing.

Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0554 : Medication Reconciliation Post-Discharge (MRP)

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities is harmonized with existing NQF-endorsed medication reconciliation measures in that all similarly specify that the medication reconciliation must address ALL prescriptions, over-the-counters,herbals,vitamin/mineral/dietary (nutritional)

supplements AND must contain the medications' name, dosage, frequency, and route. The KCQA measure, however, is unique among the currently endorsed medication reconciliation measures in that the level of analysis is the dialysis facility. The KCQA measure also moves beyond a single "check/box", specifying multiple components that must be met to be counted as a "success." It requires the following additional information on each medication, where applicable and known: indication, start and end date, discontinuation date, reason the medication was stopped or discontinued, and identification of the individual who authorized stoppage or discontinuation of the medication. Additionally, given the increasing frequency with which medical marijuana is prescribed, the KCQA measure specifies that this pharmacotherapeutic agent must be addressed during the reconciliation. KCQA believes these additional foci are necessary to ensure the medication reconciliation process is as comprehensive as possible to better identify and effectively address potential sources of adverse drug-related events and not function merely as a single "check-box" measure. Testing demonstrated these data elements are effectively captured and recorded in facility's electronic medical record systems during the routine medication reconciliation process.

5b.1 If competing, why superior or rationale for additive value: Not applicable; this medication management measure is unique in its specific focus on the ESRD population.

Comparison of NQF 0097 and NQF 3317

0097: Medication Reconciliation Post-Discharge

3317: Medication Reconciliation on Admission

Steward

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

3317: Medication Reconciliation on Admission

Centers for Medicare & Medicaid Services

Description

0097: Medication Reconciliation Post-Discharge

The percentage of discharges from January 1–December 1 of the measurement year for patients 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 days total).

3317: Medication Reconciliation on Admission

Percentage of patients for whom a designated PTA medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization.

Type

0097: Medication Reconciliation Post-Discharge

Process

3317: Medication Reconciliation on Admission

Process

Data Source

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided Attachment 0097_MRP_Fall_2020_Value_Sets.xlsx

3317: Medication Reconciliation on Admission

Electronic Health Records, Paper Medical Records The data dictionary and measure information form that provide instructions for abstracting the data for the measure are included with this application as an attachment. A structured chart abstraction tool with operational data definitions was developed in Microsoft Access for field testing. Prior to implementation, the measure developer will provide a finalized abstraction tool.

Available in attached appendix at A.1 No data dictionary

Level

0097: Medication Reconciliation Post-Discharge

Health Plan

3317: Medication Reconciliation on Admission

Facility

Setting

0097: Medication Reconciliation Post-Discharge

Outpatient Services

3317: Medication Reconciliation on Admission

Inpatient/Hospital

Numerator Statement

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

3317: Medication Reconciliation on Admission

Number of patients for whom a designated Prior to Admission (PTA) medication list was generated by referencing one or more external sources of medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization when the admission date is Day 0.

Numerator Details

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days). Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

This measure is specified for medical record or administrative data collection.

Medical Record Reporting Details:

Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.
- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the patient's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the patient was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the patient was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the patient's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Administrative Reporting Method Details:

See value sets provided for administrative codes meeting measure numerator intent.

3317: Medication Reconciliation on Admission

The numerator is operationalized into three key criteria of the medication reconciliation process that must be met:

1. Medications taken by the patient prior to admission are documented on a designated PTA medication list.
2. The PTA medication list is generated using at least one external source to identify the medications taken by the patient prior to admission.
3. All medications listed on the PTA medication list have a reconciliation action to continue, discontinue, or modify by the end of Day 2 of the hospitalization, or if there are no medications on the PTA medication list, the prescriber has signed the document by the end of Day 2 of the hospitalization to indicate his/her review of the PTA medication list.

The first criterion requires that the medical record contain a designated PTA Medication List to document medications that the patient is taking prior to admission. Documenting PTA medications in a designated location eliminates the potential for duplicative or inconsistent documentation of medication histories, avoids the potential for omitted medications, and provides a master source of PTA medication for easy reference by providers. PTA medications may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This criterion aligns with one of the five elements of The Joint Commission's National Patient Safety Goal (NPSG.03.06.01) on medication reconciliation (The Joint Commission, 2016).

The second criterion requires that facilities consult at least one source external to the facility's records to increase comprehensive capture of all active medications on the PTA medication list. Incomplete or inaccurate PTA medication lists may result in inadequate medication reconciliation actions by the prescriber, which may lead to medication errors and ADEs. Given the absence of a single, accurate source of information on PTA medications (gold standard), the measure establishes a minimum standard for compiling PTA medication information rather than being prescriptive regarding which sources should be referenced. This requirement also aligns with other existing NQF-endorsed measures that focus on medication reconciliation. The measure allows for a wide-range of external sources to account for situations where the routinely consulted source fails to generate the information needed. For example, the patient may not be able or willing to provide information on PTA medications or a retail pharmacy may be closed or not willing to disclose PTA medications without obtaining prior patient consent. Therefore, to meet the External Source requirement, the facility can reference one or more of the following sources to compile the PTA medication list:

- Interview of the patient or patient proxy such as a caregiver
- Medication container brought in by patient or patient proxy
- Medication list brought by patient or patient proxy
- Patient support network, such as a group home
- Nursing home
- Outpatient prescriber or emergency department

- Retail pharmacy
- Prescription Drug Monitoring Program (PDMP)
- Electronic prescribing network system (e.g., Allscripts®, Surescripts®) or aggregate pharmacy billing records (such as, claims data using state/federal healthcare plans)

The third and final criterion requires that a licensed prescriber reconciles each medication on the PTA Medication List by the end of Day 2 of the hospitalization and documents whether the medication should be continued, discontinued, or modified. The date of admission is considered Day 0 and subsequent days are considered Day 1 and Day 2 for this measure. If there are no medications on the PTA medication list, the prescriber must sign the document by the end of Day 2 of the hospitalization to indicate his or her review of the PTA medication list for consideration in future treatment decisions. For example, information that indicates the patient is not taking any medications may be important to communicate to the treatment team because there may be a need to initiate treatment of indications that are discovered during admission. Signing the PTA medication list by the end of Day 2 of the hospitalization for patient admissions with no PTA medications also helps to improve communication between members of the care team and other providers during care transitions. To simplify chart abstraction and prevent abstractors from having to distinguish between medications, herbal supplements, and other remedies a patient might take, all entries on the PTA medication list must be reconciled to meet the requirements of the third criterion.

For additional details on each of the data elements included in the measure construct, refer to Appendix A.1, which includes the Data Dictionary and Data Collection Tool.

Citations

*The Joint Commission. (2016). National patient safety goals effective January 1, 2017: Hospital Accreditation Program. Retrieved from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_HAP_Jan2017.pdf

Denominator Statement

0097: Medication Reconciliation Post-Discharge

All acute or nonacute inpatient discharges on or between January 1 and December 1 of the measurement year for patients who are 18 years and older.

3317: Medication Reconciliation on Admission

All patients admitted to an inpatient facility from home or a non-acute setting.

Denominator Details

0097: Medication Reconciliation Post-Discharge

To identify an acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year do the following:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

To identify nonacute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.
4. Identify the discharge date for the stay.

Additional guidance for identifying appropriate discharges for inclusion in the eligible population:

- If a patient remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this patient, but the organization must have a method for identifying the patient's status for the remainder of the measurement year, and may not assume the patient remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the patient remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.

Additional guidance for identifying the eligible population:

Patients in hospice are removed from the eligible population.

3317: Medication Reconciliation on Admission

All adult and pediatric patients admitted to an IPF are eligible to be sampled, regardless of insurance types.

Exclusions

0097: Medication Reconciliation Post-Discharge

No exclusions.

3317: Medication Reconciliation on Admission

The measure applies two exclusion criteria to ensure that it is feasible to complete the medication reconciliation process on admission to the IPF:

1. Patients transferred from an acute care setting
2. Patient admissions with a length of stay less than or equal to 2 days

Exclusion Details

0097: Medication Reconciliation Post-Discharge

N/A

3317: Medication Reconciliation on Admission

Transfer from an Acute Care Setting:

The first exclusion criterion applies to patient admissions that result from a transfer from an acute care setting, such as another inpatient facility or inpatient unit. This exclusion is applied because medication reconciliation with outpatient medications may have been done at the transferring facility and different medication reconciliation processes are required at the receiving IPF for those admissions to focus on the regimen that was used in the transferring facility. Patient admissions from long-term care facilities and emergency departments are not considered transfers and are included in the denominator for the measure.

Length of Stay Less than or Equal to 2 Days:

The second exclusion criterion applies to patient admissions with lengths of stay shorter than the time needed to adequately complete the medication reconciliation process. The timeframe from admission needed to complete the medication reconciliation process was discussed with the TEP, which recommended a requirement to complete reconciliation by the end of Day 2 if the day of admission is Day 0. They cited instances where patients are admitted on weekends and outpatient providers are not available to ascertain PTA medications or where patients are not stable enough to provide information immediately upon admission. The measure developer also evaluated this timeframe empirically using the field testing data to determine when most facilities could complete the medication reconciliation process. Table 2b2.2 in the NQF Measure Testing Form contains all records with complete medication reconciliation for all medications on the PTA medication list and shows the percentage of those records that had completed the medication reconciliation in one day increments of time from admission. This analysis confirmed the appropriateness of the 2-day timeframe for completing the medication reconciliation process.

Risk Adjustment

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

3317: Medication Reconciliation on Admission

No risk adjustment or risk stratification

Stratification

0097: Medication Reconciliation Post-Discharge

N/A

3317: Medication Reconciliation on Admission

Not applicable because this measure is not stratified.

Type Score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

3317: Medication Reconciliation on Admission

Rate/proportion better quality = higher score

Algorithm

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older. Do not include patients who were discharged then subsequently readmitted to the hospital or directly transferred to another inpatient setting. Also do not include patients who received hospice services during the measurement year.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge mediations with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2.

3317: Medication Reconciliation on Admission

To calculate the performance score:

1. Start processing. Run cases that are included in the Initial Patient Population as follows:
   a. Find the patients that the performance measure is designed to address (all adult and pediatric patients admitted to the inpatient facility from home or a non-acute setting with a length of stay greater than two days).
2. Check Length of Stay (calculated as the Discharge Date minus the Admission Date).
   a. If the Length of Stay is greater 2 days, continue processing and proceed to Transfer From an Acute Care Setting.
   b. If the Length of Stay is less than or equal to 2 days, the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
3. Check Transfer From an Acute Care Setting.
   a. If the Transfer From an Acute Care Setting is equal to 1 (Yes), the case was admitted from a transfer from an acute care setting and the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If the Transfer From an Acute Care Setting is equal to 2 (No), the case was admitted from an admission source other than an acute case setting. Continue processing and proceed to Designated PTA Medication List.
4. Check Designated PTA Medication List.
   a. If the Designated PTA Medication List is equal to 1 (Yes), continue processing and proceed to External Source.
   b. If the Designated PTA Medication List is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
5. Check External Source.
   a. If External Source is equal to 1 (Yes), continue processing and proceed to Reconciliation Action.
   b. If External Source is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
6. Check Reconciliation Action.
   a. If Reconciliation Action is equal to 1 (Yes) or 3 (N/A), continue processing and proceed to Reconciliation Action by End of Day 2.
   b. If Reconciliation Action is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
7. Check Reconciliation Action by the end of Day 2 when the Admission date is Day 0.
   a. If Reconciliation Action by End of Day 2 is equal to 1 (Yes), the record will proceed to Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
   b. If Reconciliation Action by End of Day 2 is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Submission items

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0419 : Documentation of Current Medications in the Medical Record

0553 : Care for Older Adults (COA) – Medication Review

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

3317 : Medication Reconciliation on Admission

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and a current medication list conducted post hospital discharge by a prescribing practitioner, clinical pharmacist or registered nurse and documented in the outpatient record. The denominator for this measure is all discharges from an acute or nonacute facility for patients 18+.

Related Measures:

Measure 0553 is conducted at the Special Needs Plan (SNP) level. This measure assesses annual outpatient medication review (as distinct from reconciliation) by a prescribing practitioner or clinical pharmacist among patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419e is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

Measure 3317 is conducted at the facility level. This measure assesses the percentage of patients for whom a designated prior to admission (PTA) medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization. The list may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This measure only looks at whether the medication should be continued, discontinued or modified. Given this measure targets medications prior to an admission and assesses adult and pediatric patients it is not competing.

Measure 2988 is conducted at the facility level. This measure assesses the percentage of patient-months for which medication reconciliation was performed and documented by an eligible professional. All known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana) need to be reconciled. The target population is members receiving dialysis and the measure aims to assess the use of at-home medications and compare them with medications in the dialysis medical record. This measure is different because of the target population and focus and therefore is not competing.

3317: Medication Reconciliation on Admission

5.1 Identified measures: 0293 : Medication Information

0097 : Medication Reconciliation Post-Discharge

0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

0553 : Care for Older Adults (COA) – Medication Review

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: The Measure Developer evaluated existing measures in the NQF portfolio to determine whether the Medication Reconciliation on Admission measure would compete with existing measures. Among the five NQF-endorsed measures that evaluate the medication reconciliation process, three (NQF #0097, #0553, #2988) are specified for the outpatient setting and the two (NQF #0293 and #0646) that are specified for the inpatient setting focus on communication of information at discharge. Therefore, the Medication Reconciliation on Admission measure is the only measure that evaluates medication reconciliation on admission to an inpatient facility. To align definitions with other measures that establish a designated timeframe by which a given process must be completed from admission, the Measure Developer harmonized the Medication Reconciliation on Admission measure timeframes with the timeframe specifications of SUB-1 Alcohol Use Screening (NQF 1661) and TOB-1 Tobacco Use Screening (NQF 1651), developed by The Joint Commission. Both measures define the length of stay in calendar days. Standardizing definitions for calculating length of stay using the admission and discharge dates without factoring-in the admission and discharge times will not only help reduce confusion across measures but also help to improve the reliability of the measure scores by eliminating the need to capture times, which were found to be unreliable during field testing. To develop the three data elements associated with the medication reconciliation process, the Measure Developer compared the conceptual descriptions and definitions of five NQF-endorsed measures (NQF 0553, NQF 2988, NQF 0293, NQF 0646, and NQF 0097) that evaluate the medication reconciliation process. Four of the five measures explicitly require a designated medication list. For this measure, the Measure Developer operationalized that requirement with the Designated PTA Medication List data element. Of the three measures that required collection of medications, two had requirements for the types of sources that should be referenced to compile the list. For the Medication Reconciliation on Admission measure, the Measure Developer set to establish a minimum standard and aligned with the approach to require “one or more external sources.” While several measures required the type of information to be collected on each medication, the Measure Developer decided not to include those data

elements in this measure given the high performance and low variation for those data elements in testing. Each of the measures defines the process of reconciling the medications on the list differently. The Measure Developer incorporated aspects of each definition that are most applicable to the IPF setting. For example, the Measure Developer aligned with measures that require that the reconciliation be completed by a prescriber and that there be documentation of whether each medication be continued, modified, or discontinued. Finally, the Measure Developer considered different approaches to scoring the measure. Four of the five NQF-endorsed measures require that all aspects of the medication reconciliation process be completed for a patient to pass the measure. The fifth measure evaluates the number of patient months for which the medication reconciliations were completed, however, this is only applicable in the outpatient setting. Therefore, the Measure Developer aligned the scoring approach to produce measure scores that represent the percentage of patient admissions that meet all the medication reconciliation criteria.

5b.1 If competing, why superior or rationale for additive value: This measure complements other existing measures because it focuses on the completion of the medication reconciliation process by the end of Day 2 of the hospitalization to the facility, which is not addressed by any existing measure. Medication reconciliation on admission is important to inform accurate medication reconciliation at discharge, which is evaluated by two of the existing measures. Medication reconciliation on admission also ensures that efforts to reconcile medications in the outpatient setting are continued at the transition to the inpatient setting.

Comparison of NQF 0468 and NQF 0231

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0231: Pneumonia Mortality Rate (IQI #20)

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

0231: Pneumonia Mortality Rate (IQI #20)

Agency for Healthcare Research and Quality

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

0231: Pneumonia Mortality Rate (IQI #20)

In-hospital deaths per 1,000 hospital discharges with pneumonia as a principal diagnosis for patients ages 18 years and older. Excludes obstetric discharges and transfers to another hospital.

[NOTE: The software provides the rate per hospital discharge. However, common practice reports the measure as per 1,000 discharges. The user must multiply the rate obtained from the software by 1,000 to report in-hospital deaths per 1,000 hospital discharges.]

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

0231: Pneumonia Mortality Rate (IQI #20)

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

0231: Pneumonia Mortality Rate (IQI #20)

Claims HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD.

URL Attachment IQI_Regression_Coefficients-_Code_Tables_and_Value_Sets.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

0231: Pneumonia Mortality Rate (IQI #20)

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

0231: Pneumonia Mortality Rate (IQI #20)

Inpatient/Hospital

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

0231: Pneumonia Mortality Rate (IQI #20)

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

0231: Pneumonia Mortality Rate (IQI #20)

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

0231: Pneumonia Mortality Rate (IQI #20)

Discharges, for patients ages 18 years and older, with a principal ICD-9-CM diagnosis code for pneumonia.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

   Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;
2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and

5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

0231: Pneumonia Mortality Rate (IQI #20)

ICD-9-CM Pneumonia diagnosis codes:

00322 SALMONELLA PNEUMONIA

0212 PULMONARY TULAREMIA

0391 PULMONARY ACTINOMYCOSIS

0521 VARICELLA PNEUMONITIS

0551 POSTMEASLES PNEUMONIA

0730 ORNITHOSIS PNEUMONIA

1124 CANDIDIASIS OF LUNG

1140 PRIMARY COCCIDIOIDOMYCOS

1144 CHRONIC PULMON COCCIDIOIDOMYCOSIS

1145 UNSPEC PULMON COCCIDIOIDOMYCOSIS

11505 HISTOPLASM CAPS PNEUMON

11515 HISTOPLASM DUB PNEUMONIA

11595 HISTOPLASMOSIS PNEUMONIA

1304 TOXOPLASMA PNEUMONITIS

1363 PNEUMOCYSTOSIS

4800 ADENOVIRAL PNEUMONIA

4801 RESP SYNCYT VIRAL PNEUM

4802 PARINFLUENZA VIRAL PNEUM

4803 PNEUMONIA DUE TO SARS

4808 VIRAL PNEUMONIA NEC

4809 VIRAL PNEUMONIA NOS

481 PNEUMOCOCCAL PNEUMONIA

4820 K. PNEUMONIAE PNEUMONIA

4821 PSEUDOMONAL PNEUMONIA

4822 H.INFLUENZAE PNEUMONIA

48230 STREP PNEUMONIA UNSPEC
48231 GRP A STREP PNEUMONIA
48232 GRP B STREP PNEUMONIA
48239 OTH STREP PNEUMONIA
4824 STAPHYLOCOCCAL PNEUMONIA
48240 STAPH PNEUMONIA UNSP
48241 METH SUS PNEUM D/T STAPH
48242 METH RES PNEU D/T STAPH
48249 STAPH PNEUMON OTH
48281 ANAEROBIC PNEUMONIA
48282 E COLI PNEUMONIA
48283 OTH GRAM NEG PNEUMONIA
48284 LEGIONNAIRES DX
48289 BACT PNEUMONIA NEC
4829 BACTERIAL PNEUMONIA NOS
4830 MYCOPLASMA PNEUMONIA
4831 CHLAMYDIA PNEUMONIA
4838 OTH SPEC ORG PNEUMONIA
4841 PNEUM W CYTOMEG INCL DIS
4843 PNEUMONIA IN WHOOP COUGH
4845 PNEUMONIA IN ANTHRAX
4846 PNEUM IN ASPERGILLOSIS
4847 PNEUM IN OTH SYS MYCOSES
4848 PNEUM IN INFECT DIS NEC
485 BRONCOPNEUMONIA ORG NOS
486 PNEUMONIA, ORGANISM NOS
4870 INFLUENZA WITH PNEUMONIA
48801 INFLUENZA D/T IDENTIFIED AVIAN INFLUENZA VIRUS
48811 INFLUENZA D/T IDENTIFIED 2009 H1N1 INFLUENZA VIRUS W/PNEUMONIA
48881 NOVEL INFLUENZA W/PNEUMONIA

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

0231: Pneumonia Mortality Rate (IQI #20)

Exclude cases:

- transferring to another short-term hospital (DISP=2)
- MDC 14 (pregnancy, childbirth, and puerperium)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years; 2) if the discharge date for a hospitalization is before the admission date; or 3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

0231: Pneumonia Mortality Rate (IQI #20)

Exclude cases:

- transferring to another short-term hospital (DISP=2)
- MDC 14 (pregnancy, childbirth, and puerperium)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

0231: Pneumonia Mortality Rate (IQI #20)

Statistical risk model

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

0231: Pneumonia Mortality Rate (IQI #20)

Not applicable

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

0231: Pneumonia Mortality Rate (IQI #20)

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

0231: Pneumonia Mortality Rate (IQI #20)

The measure is expressed as a rate, defined as (outcome of interest / population at risk) or (numerator / denominator). The AHRQ Quality Indicators (AHRQ QI) software performs six steps to produce the rate 1) Discharge-level data is used to identify inpatient records containing the outcome of interest and 2) the population at risk. 3) Calculate observed rates. Using output from steps 1

and 2, observed rates are calculated for user-specified combinations of stratifiers. 4) Calculate expected rates. Use the risk-adjustment model to calculate the rate one would expect at the hospital based on the hospital´s case-mix and the average performance for that case-mix in the reference population. 5) Calculate risk-adjusted rate. Use the indirect standardization to account for case-mix. For indicators that are not risk-adjusted, the risk-adjusted rate is the same as the observed rate. 6) Calculate smoothed rate. A Univariate shrinkage estimator is applied to the risk-adjusted rates. The shrinkage estimator reflects a reliability adjustment unique to each indicator and provider. The estimator is the signal-to-noise ratio, where signal is the between provider variance and noise is the within provider variance.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients

with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

0231: Pneumonia Mortality Rate (IQI #20)

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value: AHRQ and CMS engaged in a harmonization process when both measures were submitted for endorsement. In-hospital mortality and 30-day mortality measures are complementary and provide alternative perspectives on hospital performance. In-hospital mortality measures may be calculated by the hospital in real time without the need to link to vital records or other sources of mortality data.

Comparison of NQF 0468 and NQF 0279

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Agency for Healthcare Research and Quality

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports

the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Discharges with a principal diagnosis of community acquired bacterial pneumonia per 100,000 population, age 18 or older. Excludes sickle cell or hemoglobin-S admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions.

[NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Claims While the measure is tested and specified using data from the Healthcare Cost and Utilization Project (HCUP) (see section 1.1 and 1.2 of the measure testing form), the measure specifications and software are specified to be used with any ICD-9-CM- or ICD-10-CM/PCS coded administrative billing/claims/discharge dataset.

Available at measure-specific web page URL identified in S.1 Attachment PQI_11_Community_Acquired__Pneumonia_Admission_Rate.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Inpatient/Hospital

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a

secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Discharges, for patients ages 18 years and older, with a principal ICD-10-CM diagnosis code for bacterial pneumonia (ACSBACD).

[NOTE: By definition, discharges with a principal diagnosis of bacterial pneumonia are precluded from an assignment of MDC 14 by grouper software. Thus, obstetric discharges should not be considered in the PQI rate, though the AHRQ QI™ software does not explicitly exclude obstetric cases.]

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Community acquired bacterial pneumonia diagnosis codes: (ACSBACD)

J13 - Pneumonia due to Streptococcus pneumoniae

J14 - Pneumonia due to Hemophilus influenzae

J15211 - Pneumonia due to Methicillin susceptible Staphylococcus aureus

J15212 - Pneumonia due to Methicillin resistant Staphylococcus aureus

J153 - Pneumonia due to streptococcus, group B

J154 - Pneumonia due to other streptococci

J157 - Pneumonia due to Mycoplasma pneumoniae

J159 - Unspecified bacterial pneumonia

J160 - Chlamydial pneumonia

J168 - Pneumonia due to other specified infectious organisms

J180 - Bronchopneumonia, unspecified organism

J181 - Lobar pneumonia, unspecified organism

J188 - Other pneumonia, unspecified organism

J189 - Pneumonia, unspecified organism

Sickle cell anemia or HB-S disease diagnosis codes: (ACSBA2D)

D570- Hb-SS disease with crisis, unspecified

D5701 - Hb-SS disease with acute chest syndrome

D5702 - Hb-SS disease with splenic sequestration

D571 - Sickle-cell disease without crisis

D5720 - Sickle-cell/Hb-C disease without crisis

D57211 - Sickle-cell/Hb-C disease with acute chest syndrome

D57212 - Sickle-cell/Hb-C disease with splenic sequestration

D57219 - Sickle-cell/Hb-C disease with crisis, unspecified

D5740 - Sickle-cell thalassemia without crisis

D57411 - Sickle-cell thalassemia with acute chest syndrome

D57412 - Sickle-cell thalassemia with splenic sequestration

D57419 - Sickle-cell thalassemia with crisis, unspecified

D5780 - Other sickle-cell disorders without crisis

D57811 - Other sickle-cell disorders with acute chest syndrome

D57812 - Other sickle-cell disorders with splenic sequestration

D57819 - Other sickle-cell disorders with crisis, unspecified

Appendix A – Admission Codes for Transfers

Appendix C – Immunocompromised State Diagnosis and Procedure Codes

(See attached technical specifications, Appendix A, and Appendix C for detailed list of codes.)

Exclude cases:

- transfer from a hospital (different facility) (Appendix A)
- transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF) (Appendix A)
- transfer from another health care facility (Appendix A)
- with any-listed ICD-10-CM diagnosis codes for sickle cell anemia or HB-S disease (ACSBA2D)
- with any-listed ICD-10-CM diagnosis codes (Appendix C) or any-listed ICD-10-PCS procedure codes for immunocompromised state (Appendix C)
- with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing)

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Population ages 18 years and older in metropolitan area* or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.

*The term “metropolitan area” (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, “area” could refer to either

1) FIPS county,
2) modified FIPS county,
3) 1999 OMB Metropolitan Statistical Area, or
4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

   Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;
2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Not applicable.

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Not applicable.

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

   Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.
2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;
   2) if the discharge date for a hospitalization is before the admission date; or
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.
3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.
4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Not applicable.

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

No risk adjustment or risk stratification

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Not applicable.

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in

patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

Risk adjustment is not currently included in the ICD-10-CM/PCS v2018 of the AHRQ QI specifications, due to the transition to ICD-10-CM/PCS (October 1, 2015). At least one full year of data coded in ICD-10-CM/PCS is needed in order to develop robust risk adjustment models. A full year of ICD-10-CM/PCS coded all-payer data will not be available until mid-2019. AHRQ will announce an anticipated date as soon as one is known.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

0279: Community Acquired Pneumonia Admission Rate (PQI 11)

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

Comparison of NQF 0468 and NQF 0506

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization
0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Centers for Medicare & Medicaid Services

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and older discharged from the hospital with either a principal discharge diagnosis of pneumonia (including aspiration pneumonia) or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). Readmission is defined as an unplanned readmission for any cause within 30 days of the discharge date for the index admission. Readmissions are classified as planned and unplanned by applying the planned readmission algorithm. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on

admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived from the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) index score at the patient nine-digit zip code level for use in studying the association between our measure and social risk factors (SRFs).

References

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNreadmission_Fall2020_final_7.22.20.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Inpatient/Hospital

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a

secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The outcome for this measure is 30-day readmissions. We define readmission as an inpatient acute care admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients 65 and older discharged from the hospital with a principal diagnosis of pneumonia, including aspiration pneumonia or a principal diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary diagnosis of severe sepsis. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index pneumonia admission, excluding planned readmissions as defined below.

Planned Readmission Algorithm (Version 4.0)

The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare claims and VA administrative data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital.

The planned readmission algorithm has three fundamental principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/immunotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and,
3. Admissions for acute illness or for complications of care are never planned.

The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures.

In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the pneumonia measure without modifications.

The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;
2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries;
3. Aged 65 or over;
4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and,
5. Not transferred from another acute care facility.

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The 30-day pneumonia (PN) readmission measure excludes index admissions for patients:

1. Discharged against medical advice (AMA);
2. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries);
3. Admitted within 30 days of a prior index admission for pneumonia.

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

   Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;
   2) if the discharge date for a hospitalization is before the admission date; or
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

   After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The pneumonia readmission measure excludes index admissions for patients:

1. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

2. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database.

   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.

3. Pneumonia admissions within 30 days of discharge from a qualifying pneumonia index admission are identified by comparing the discharge date from the index admission with subsequent admission dates.

Rationale: Additional pneumonia admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Statistical risk model

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

N/A

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of “predicted” to the number of “expected” deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30

days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality.

The “predicted” number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The “expected” number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology).

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal

discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

2882 : Excess days in acute care (EDAC) after hospitalization for pneumonia

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 0468 and NQF 1891

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and over discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD. The outcome (readmission) is defined as unplanned readmission for any cause within 30 days of the discharge date for the index admission (the admission included in the measure cohort). A specified set of planned readmissions do not count in the readmission outcome. CMS annually reports the measure for patients who are 65 years or older and are enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al.,

1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual-eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated AHRQ SES index score at the patient nine-digit zip code level for use in studying the association between our measure and SRFs.

References

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDreadmission_Fall2020_final_7.22.20.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a

secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day readmission. We define readmission as an inpatient admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients discharged from the hospital with a principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index COPD admission, excluding planned readmissions as defined below.

Planned Readmission Algorithm (Version 4.0)

The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare and VA administrative claims data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital.

The planned readmission algorithm has three fundamental principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/ immunotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and,

3. Admissions for acute illness or for complications of care are never planned.

The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures.

In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the COPD measure without modifications.

The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The cohort includes admissions for patients aged 65 or older, who have been discharged from the hospital with either a principal discharge diagnosis of COPD OR a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD and with a complete claims history for the 12 months prior to admission.

Additional details are provided in S.9 Denominator Details.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);

3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of COPD with exacerbation;
2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B Medicare for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries;
3. Aged 65 or over;
4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and,
5. Not transferred to another acute care facility.

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The 30-day COPD readmission measures exclude index admissions for patients:

1. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries);
2. Discharged against medical advice (AMA); and,
3. Admitted within 30 days of a prior index admission for COPD.

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

   Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;
   2) if the discharge date for a hospitalization is before the admission date; or
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

   After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database.

   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.

2. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3. COPD admissions within 30 days of discharge from a qualifying COPD index admission are identified by comparing the discharge date from the index admission with subsequent admission dates.

Rationale: Additional COPD admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a

distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of discharge from the index admission using age, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions

within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality.

The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology).

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2879 : Hybrid Hospital-Wide Readmission (HWR) Measure with Claims and Electronic Health Record Data

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome

measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 0468 and NQF 1893

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary

discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries

3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;

2) if the discharge date for a hospitalization is before the admission date; or
3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;
   3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of “predicted” to the number of “expected” deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital’s performance with its observed case mix, and the denominator is the number of deaths expected based on the nation’s performance with that hospital’s case mix. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital’s performance

given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted

value. The “expected” number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital

care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 0468 and NQF 2579

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

2579: Care Coordination

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

2579: Care Coordination

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

2579: Care Coordination

Inpatient/Hospital

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

2579: Care Coordination

Respiratory : Pneumonia

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al.,

1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

2579: Care Coordination

We do not impute missing data for any of the variables included in the measure. However, if a hospitalization is missing a DRG or DRG weight, we exclude it as an index admission. Inpatient services: Inpatient facility services; Inpatient services: Evaluation and management; Inpatient services: Procedures and surgeries; Inpatient services: Imaging and diagnostic; Inpatient services: Lab services; Inpatient services: Admissions/discharges; Inpatient services: Labor (hours, FTE, etc.); Other inpatient services; Ambulatory services: Outpatient facility services; Ambulatory services: Emergency Department; Ambulatory services: Pharmacy; Ambulatory services: Evaluation and management; Ambulatory services: Procedures and surgeries; Ambulatory services: Imaging and diagnostic; Ambulatory services: Lab services; Ambulatory services: Labor (hours, FTE, etc.); Other ambulatory services; Durable Medical Equipment (DME); Other services not listed

See S.7.8 for a full list of care settings included Data Sources

Medicare Inpatient and Outpatient Administrative Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims.

The 2020 reporting period for these analyses include Medicare administrative claims and enrollment information for patients with hospitalizations between July 1, 2016 and June 30, 2019. Medicare administrative claims for the 12 months prior to and during the index admission are used for risk adjustment. The period for public reporting of the PN payment measure aligns with the 30-day PN mortality and readmission measures for harmonization purposes.

The datasets also contain price-standardized payments for Medicare patients across all Medicare settings, services, and supplies (that is, inpatient, outpatient, SNF, home health agency, hospice, physician/clinical laboratory/ambulance services, and durable

medical equipment, prosthetics/orthotics, and supplies). The CMS Standardization Methodology for Allowed Amount for 2009 through 2019 was applied to the claims to calculate the measures. Price-standardized payments for Medicare patients across all Medicare settings, services, and supplies (that is, inpatient, outpatient, SNF, home health agency, hospice, physician/clinical laboratory/ambulance services, and durable medical equipment, prosthetics/orthotics, and supplies) were calculated using standardized methodology specific to services reimbursed through Medicare parts A and B (for specific values see https://www.resdac.org/articles/cms-price-payment-standardization-overview).

Medicare Enrollment Database (EDB)

This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This dataset was used to obtain information on enrollment, date of birth, and post-discharge mortality status. These data have previously been shown to accurately reflect patient vital status (Fleming et al. 1992).

Medicare Fee Schedules

Fee schedules are lists of pre-determined reimbursement amounts for certain services and supplies (e.g. physician services, independent clinical labs, ambulance services, durable medical equipment) and are used by Medicare in the calculation of payment to providers. We used the applicable fee schedules when calculating payments for claims that occurred in each care setting.

Federal Register Final Rules for Medicare Prospective Payment Systems and Payment Policies

Certain data necessary to calculate payments (e.g. annual base payments and conversion factors, DRG weights, wage indexes, and average length of stay) were taken from applicable Federal Register Final Rules.

CMS-published Wage Index Data

Wage index data not published in Federal Register Final Rules (such as the wage index data for Renal Dialysis Facilities) were obtained through the CMS website.

American Community Survey (2013-2017)

We used the American Community Survey (2013-2017) to derive an updated Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) index score at the patient nine-digit zip code level for use in studying the association between our measure and social risk factors (SRFs).

Reference

Fleming, C., Fisher, E., Chang, C., Bubolz, T., & Malenka, D. (1992). Studying Outcomes and Hospital Utilization in the Elderly: The Advantages of a Merged Data Base for Medicare and Veterans Affairs Hospitals. Medical Care, 30(5), 377-391.

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

2579: Care Coordination

See S.7.8 for a full list of care settings included

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

2579: Care Coordination

See S.7.8 for a full list of care settings included To estimate payments for a 30-day episode of care for PN we included payments for all care settings, services, and supplies, except drugs covered under Part D Medicare claims. We did not include Part D since a large proportion of Medicare beneficiaries are not enrolled in Part D and there is variation in enrollment status across and within states. Including payments for Part D services would thus bias payments upwards for hospitals with high Part D enrollment. By following patients through an episode of care for PN, CMS and hospitals can gain key insights into the drivers of payments and how practice patterns vary across providers.

We include payments for the following care settings below in the measure:

Inpatient hospital facility and physician

Outpatient hospital facility and physician

Skilled nursing facility and physician

Hospice facility and physician

Home health facility and physician

Inpatient psychiatric facility and physician

Inpatient rehab facility and physician

Long-term care hospital facility

Clinical labs facility and physician

Comprehensive outpatient rehab facility and physician

Outpatient rehab facility and physician

Renal dialysis facility and physician

Community mental health centers facility and physician

DME/POS/PEN

Observation stay facility

Part B drugs

Ambulance and ambulance physician

Emergency department facility and physician
Physician office
Federally qualified health centers facility and physician
Rural health clinics facility and physician
Ambulatory surgical centers facility and physician
We also include physician payments for the following care settings:
Indian health service free-stand facility
Indian health service provider facility
Tribal free-standing facility
Tribal facility
Military treatment facility
Independent clinic
State or local health clinic
Mass immunization center
Walk-in retail health clinic
Urgent care facility
Unassigned
Pharmacy
School
Homeless Shelter
Prison
Group Home
Mobile Unit
Temporary Lodging
Birthing Center
Intermediary Care/Mentally Retarded
Residential Substance Abuse
Psychiatric Residential Facility
Non-Residential Substance Abuse
Other Physician

Other carrier claims with HCPCS codes P9603 or P9604

In order to determine how to assign claims, we examine the place of service code for physician claims and a combination of claim type and facility type codes to determine the facility in which care was provided. Depending on the facility and physician codes we standardize payments differently. Information on how we standardize claims can be found in the methodology report.

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

2579: Care Coordination

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

2579: Care Coordination

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

2579: Care Coordination

This measure estimates hospital-level, risk-standardized payments for a 30-day episode of care for PN. To this end, we constructed a cohort of PN patients by examining the principal discharge diagnosis in administrative claims data. Specifically, we included Medicare fee-for-service patients 65 or older with a principal discharge diagnosis of an AMI (defined by ICD-10 codes in attached data dictionary). We then applied several exclusion criteria as detailed in S.9.1.

Once our cohort was finalized we examined all payments for these patients (including co-pays, co-insurance, and deductibles) that occurred within 30 days of the index admission. We included payments for all care settings, except Part D Medicare claims. We standardized payments across providers by removing or averaging geographic differences and removing policy adjustments from the total payment for that service. These payments were then assigned to the initial admitting hospital. As part of our model, we risk adjusted these payments for patient comorbidities listed in outpatient and inpatient claims in the 12 months prior to the index admission as well as the secondary diagnoses included in the index admission. We then used hierarchical generalized linear regression models to calculate a risk-standardized payment for each hospital.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

2579: Care Coordination

To construct the measure, we use Medicare administrative claims data. These data contain claims for all care settings, supplies, and services as outlined in Section S.7.8. (except Part D). Claim payment data are organized by the setting, supply, or service in which they were rendered. Standard Medicare payment rates were assigned to each service based on claim type, facility type, and place of service codes. These payments are then summed by individual patients. To create a hospital-level measure, we aggregate the payments for all eligible patients at each hospital.

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

2579: Care Coordination

URL

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

   Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;
   2) if the discharge date for a hospitalization is before the admission date; or
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

   After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also,

for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

2579: Care Coordination

https://qualitynet.cms.gov/files/5d0d37f3764be766b0101db2?filename=PN_Pymnt_MeasMeth_Rprt_092513.pdf

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

2579: Care Coordination

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

2579: Care Coordination

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

2579: Care Coordination

This measure examines payments for a 30-day episode of care beginning with an admission for PN and extending to 30-days post-admission. We determine if a patient has an PN by examining the principal discharge diagnosis code in the administrative data. If a patient has a principal discharge diagnosis of any other condition, even if this includes a secondary diagnosis of PN, this admission is not considered as an index admission. Therefore, the concurrency of clinical events is not an issue when determining what triggers the episode of care. Once, an episode is triggered, however, we include payments for all care settings, except Part D Medicare claims. The model risk adjusts for comorbidities listed in outpatient and inpatient claims in the 12 months prior to the index admission as well as the secondary diagnoses included in the index admission that are not considered complications of care. The measure includes payments for all care settings, except Part D, that occur during the 30-day window. If a claim for a complimentary service was filed in the study window, then it would be included in the measure.

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

2579: Care Coordination

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

2579: Care Coordination

5.1 Identified measures: As part of the measure methodology we compare payments for a hospital with the expected payment amounts for an average hospital with the same case mix. While we include all hospitals when estimating the risk-adjustment model, we do not report RSPs for hospitals with fewer than 25 PN admissions, since estimates for hospitals with fewer procedures are less reliable and CMS's past approach to public reporting has been not to report these results.

5a.1 Are specs completely harmonized? Comparative estimates are provided by classifying hospitals as less than average, no different than average, or greater than average payment depending on the span of their confidence interval in comparison with the national average payment amount (i.e., the benchmark). To categorize hospital payments, we estimate each hospital's RSP and the corresponding 95% interval estimate. As with all estimates, there is a degree of uncertainty associated with the RSP. The interval estimate is a range of probable values around the RSP that characterizes the amount of uncertainty associated with the estimate. A 95% interval estimate indicates that there is 95% probability that the true value of the RSP lies between the lower limit and the upper limit of the interval. In an effort to provide fair comparisons, we provide three categories (less than, no different than, or greater than the national average payment amount), which allows for conservative discrimination of hospital RSPs.

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

Comparison of NQF 0468 and NQF 3502

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Centers for Medicare & Medicaid Services

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date for patients who are between the ages of 50 and 94.

Please note that in parallel with the hybrid HWM measure, we are submitting a claims-only HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e).

Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure.

Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment).

Differences in the measure, data, and testing that reflect limitations in data availability

1. Dataset used for development, some testing (see below for differences), and measure results:
    a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database.
    b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information.
2. Age of patients in cohort:
    a. The claims-only measure includes Medicare FFS patients, age 65-94.
    b. The hybrid measure includes all patients age 50-94 (see later discussion for justification)
3. External empiric validity testing
    a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
4. Socioeconomic risk factor analyses
    a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
5. Exclusion analyses
    a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure.
6. Meaningful differences
    a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure.

Difference between the two measures when fully harmonized, prior to implementation:

1. Risk adjustment:
    a. The claims-only measure uses administrative claims data only for risk adjustment
    b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Claims, Electronic Health Records, Other Clinical-Hybrid Dataset

Constructed using Kaiser Permanente Northern California matched administrative claims and electronic health record (EHR) data, admission dates from October 1, 2015 – December 30, 2016. This data source was used for measure testing. (An earlier Kaiser dataset from that included all admissions for adult patients to any of their member hospitals between January 1, 2009 and June 30, 2015 was used for measure development, as described in the attached methodology report).

The two data sources listed below were used for testing the claims-based measure; the hybrid testing form includes some testing data from the claims-based measure (for example, for the social risk factor and external validation analyses).

HWM claims-only datasets:

Medicare Part A Inpatient Claims Data

The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission. This data was used along with the Medicare Enrollment Database (EDB) for testing the claims-based measure.

Medicare Enrollment Database (EDB)

This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment.

No data collection instrument provided Attachment Del18b2HOP5HWMHybridDataDictionary01072019.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Inpatient/Hospital, Other Home-based primary care and home-based palliative care); Settings include: Home, Boarding home, Domiciliary, Assisted Living Facilities, Rest Home or Custodial Care Services

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure outcome is death from any cause within 30 days of the admission date of the index admission. The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The cohort includes inpatient admissions for a wide variety of conditions for patients aged between 50 and 94 years old who were discharged from short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details. The age range for this measure differs from that of the claims-only measure due to the limited size of the dataset used for testing. The intent is to harmonize the age range of the hybrid measure with the age range of the claims-only measure, so that both will include admissions for patients age 65-94.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

   Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;
2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The index cohort includes all inpatient admissions for patients aged 50-94 years old. (Note: The intention is to fully harmonize the cohort definition with the claims-only measure so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing due to the limited dataset available that included the EHR data elements needed to calculate this measure. Note that the risk model already includes age in years, as a risk variable.)

An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients:

1. Not transferred from another acute care facility

   Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any “transfer-in” hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission).
2. Aged between 50 and 94 years

The hybrid measure is intended for the Medicare FFS population but was tested in a limited dataset due to the EHR data elements included. The use of a small dataset required that we expand the sample by including admissions from patients ages 50 to 94 years. Note that the measure already adjusts for age.

3. Not admitted for primary psychiatric diagnoses

   Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab).

4. Not admitted for rehabilitation

   Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab).

5. Not enrolled in hospice at the time of, or 12 months prior to, their index admission

   Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal

6. Not enrolled in hospice within two days of admission

   Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received.

7. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission

   Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab).

8. Without any diagnosis of metastatic cancer

   Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab).

9. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival

   Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list.

   In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions

and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure.

The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability.

The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure; 2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams.

The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures.

For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel.

The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions.

The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure excludes index admissions for patients:

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data;
2. Discharged against medical advice (AMA);
3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and
4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;
   2) if the discharge date for a hospitalization is before the admission date; or
   3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability

of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data.

   Rationale: The measure does not include stays for patients where the admission date is after the date of death, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data.

2. Discharged against medical advice (AMA)

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240).

   Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals.

4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.

   Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded.

   Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Statistical risk model

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

N/A

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the

same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique.

Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of “predicted” deaths to the number of “expected” deaths at a given hospital. The predicted number of deaths is based on the hospital’s performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation’s performance with that hospital’s case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows a particular hospital’s performance, given its case mix and service mix, to be compared to an average hospital’s performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality.

To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period.

The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. (Note that in the case of the hybrid measure, we are presenting data from 9 of the total 15 divisions due to limitations in availability of electronic health records data). The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on

admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: This hybrid HWM measure incorporates patient-level clinical data from the EHR into the risk adjustment model, compared to the claims-only hospital-wide mortality measure. This hybrid HWM measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer, whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include as many have survival as their primary goal, however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into in order to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into six categories, or “specialty cohorts”, while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. HWM captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures.

5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

Comparison of NQF 0468 and NQF 3504

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Steward

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Centers for Medicare & Medicaid Services

Description

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates a hospital-level 30-day hospital-wide risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for Medicare fee-for-service (FFS) patients who are between the ages of 65 and 94.

Please note that in parallel with the claims-only HWM measure, we are submitting a hybrid HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e).

Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure.

Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment).

Differences in the measure, data, and testing that reflect limitations in data availability

1. Dataset used for development, some testing (see below for differences), and measure results:
   a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database.
   b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information.
2. Age of patients in cohort:
   a. The claims-only measure includes Medicare FFS patients, age 65-94.
   b. The hybrid measure includes all patients age 50-94 (see later discussion for justification)
3. External empiric validity testing
   a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
4. Socioeconomic risk factor analyses
   a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
5. Exclusion analyses
   a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure.
6. Meaningful differences
   a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure.

Difference between the two measures when fully harmonized, prior to implementation:

1. Risk adjustment:
   a. The claims-only measure uses administrative claims data only for risk adjustment
   b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.

Type

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Outcome

Data Source

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

1. Medicare Part A Inpatient: The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission, hospitalized from July 1, 2016-June 30, 2017. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission.

2. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment.

No data collection instrument provided Attachment Del18b1HOP5HWMClaimsDataDictionary01072019.xlsx

Level

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Facility

Setting

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Inpatient/Hospital

Numerator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.

Numerator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure outcome is death from any cause within 30 days of the admission date of the index admission, for Medicare FFS patients identified using the Medicare Enrollment Database (EDB). The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.

Denominator Statement

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The cohort includes inpatient admissions for a wide variety of conditions for Medicare FFS patients aged between 65 and 94 years old who were admitted to short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details.

Denominator Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);
3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients:

1. Enrolled in Medicare FFS Part A for at least 12 months prior to the date of admission and during the index admission

Rationale: Claims data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment criterion ensures a full year of administrative data is available for risk adjustment.

2. Not transferred from another acute care facility

   Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any "transfer-in" hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission).

3. Aged between 65 and 94 years

   Rationale: Medicare patients younger than 65 are not included in the measure because they usually qualify for the program due to severe disability and are considered to be clinically distinct from Medicare patients 65 and over. Patients over age 94 are not included to avoid holding hospitals responsible for the survival of the very elderly patients, who may be less likely to have survival as a primary goal.

   Note that the hybrid measure (submitted for NQF endorsement in parallel with the claims-only measure) differs from the claims-only measure in terms of the age range of included admissions; the hybrid measure includes all inpatient admissions for patients aged 50-94 years old. The intention is to fully harmonize the cohort definitions for the two measures, so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing for the hybrid measure due to the limited dataset available that included the EHR data elements needed to calculate the hybrid measure. Note that the risk model already includes age in years, as a risk variable.)

4. Not admitted for primary psychiatric diagnoses

   Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab).

5. Not admitted for rehabilitation

   Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab).

6. Not enrolled in hospice at the time of, or 12 months prior to, their index admission

   Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal.

7. Not enrolled in hospice within two days of admission

   Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received.

8. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission

   Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab).

9. Without any diagnosis of metastatic cancer

Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab).

10. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival

Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list.

In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure.

The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability.

The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm:

1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure;
2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure;
3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams.

The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures.

For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel.

The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions.

The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.

Exclusions

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure excludes index admissions for patients:

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data;
2. Discharged against medical advice (AMA);
3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and
4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions within the measurement year.

Exclusion Details

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
    1) the patient's age is greater than 115 years;
    2) if the discharge date for a hospitalization is before the admission date; or
    3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

   After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data

   Rationale: The measure does not include stays for patients where the admission date is after the date of death in the Medicare Enrollment Database, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data.

2. Discharged against medical advice (AMA)

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240)

   Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals.

4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.

   Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded.

Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.

Risk Adjustment

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Statistical risk model

Stratification

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

N/A

Type Score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Rate/proportion better quality = lower score

Algorithm

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a

distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique.

Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of "predicted" deaths to the number of "expected" deaths at a given hospital. The predicted number of deaths is based on the hospital's performance with its observed case mix and service mix, and is calculated by using the coefficients

estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation's performance with that hospital's case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix and service mix, to be compared to an average hospital's performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality.

To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period.

The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.

Submission items

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific

procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: This claims-only hospital-wide mortality (HWM) measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer (with some exceptions), whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include in the HWM measure as many have survival as their primary goal; however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore, are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into, to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into five categories, or “specialty cohorts”, while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02

captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. Hospital-wide mortality captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures.

5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

Comparison of NQF 1893 and NQF 0275

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Agency for Healthcare Research and Quality

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Admissions with a principal diagnosis of chronic obstructive pulmonary disease (COPD) or asthma per 100,000 population, ages 40 years and older. Excludes obstetric admissions and transfers from other institutions.

[NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Claims While the measure is tested and specified using data from the Healthcare Cost and Utilization Project (HCUP) (see section 1.1 and 1.2 of the measure testing form), the measure specifications and software are specified to be used with any ICD-9-CM- or ICD-10-CM/PCS coded administrative billing/claims/discharge dataset.

Available at measure-specific web page URL identified in S.1 Attachment PQI_05_Chronic_Obstructive_Pulmonary_Disease_-COPD-_or_Asthma_in_Older_Adults_Admission_Rate.xlsx

Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Population : Community, County or City

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Other all community based care

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Discharges, for patients ages 40 years and older, with either (1) a principal ICD-10-CM diagnosis code for COPD (ACCOPDD*) (excluding acute bronchitis); or (2) a principal ICD-10-CM diagnosis code for asthma (ACSASTD*). Exclude cases (1) with any-listed ICD-10-CM diagnosis codes for cystic fibrosis and anomalies of the respiratory system (RESPAN*); (2) transfer from a hospital (different facility); (3) transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF); (4) transfer from another

health care facility; (5) with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing).

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

See technical specifications for full list of codes included in numerator.

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Population ages 40 years and older in metropolitan area or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD

2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

The term "metropolitan area" (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, "area" could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area, or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.

See AHRQ QI website for 2014 Population File Denominator report for calculation of population estimates embedded within AHRQ QI software programs. http://www.qualityindicators.ahrq.gov/Downloads/Software/SAS/V50/AHRQ_QI_Population_File_V50.pdf

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

n/a

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;

3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

n/a

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

No risk adjustment or risk stratification

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

n/a

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

Risk adjustment is not currently included in the ICD-10-CM/PCS v7.0 of the AHRQ QI specifications, due to the transition to ICD-10-CM/PCS (October 1, 2015). At least one full year of data coded in ICD-10-CM/PCS is needed in order to develop robust risk

adjustment models. A full year of ICD-10-CM/PCS coded all-payer data will not be available until 2018. AHRQ will announce an anticipated date as soon as one is known.

The AHRQ QI v7.0 software (SAS and WinQI) for use with ICD-10-CM/PCS produces observed rates, which may be used to evaluate performance within hospitals. However, caution should be used when comparing observed rates across hospitals because observed rates do not account for differences in patient populations (i.e., case mix).

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

0275: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

Comparison of NQF 1893 and NQF 0468

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Centers for Medicare & Medicaid Services

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission for the index admission, discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). CMS annually reports the measure for patients who are 65 years or older and are either Medicare fee-for-service (FFS) beneficiaries and hospitalized in non-federal hospitals or patients hospitalized in Veterans Health Administration (VA) facilities.

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

Reference:

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNmortality_Fall2020_final_7.22.20.xlsx

Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Facility

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Inpatient/Hospital

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The outcome for this measure is 30-day all-cause mortality (including in-hospital deaths). We define mortality as death from any cause within 30 days of the index admission datefrom the date of admission for patients hospitalized with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis.

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of admission of the index pneumonia hospitalization.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years or over in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or over older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure will be publicly reported by CMS for those patients 65 years or older who are Medicare FFS beneficiaries admitted to non-federal hospitals or patients admitted to VA hospitals.

Additional details are provided in S.9 Denominator Details.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or

Principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;

2. Enrolled in Medicare fee-for-service (FFS);

3. Aged 65 or over;
4. Not transferred from another acute care facility; and
5. Enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission and enrolled in Part A during the index admission.

We have explicitly tested the measure for those aged 65 years or over (see Testing Attachment for details).

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The mortality measure excludes index admissions for patients:

1. Discharged alive on the day of admission or the following day who were not transferred to another acute care facility;
2. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
3. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
4. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort.

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;
   3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

1. The discharge disposition indicator is used to identify patients alive at discharge. Transfers are identified in the claims when a patient with a qualifying admission is discharged from an acute care hospital and admitted to another acute care hospital on the same day or next day. Patient length of stay and condition is identified from the admission claim.

   Rationale: This exclusion prevents inclusion of patients who likely did not have clinically significant pneumonia.

2. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years;
   2) if the discharge date for a hospitalization is before the admission date; or
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

3. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice enrollment data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

4. Discharges against medical advice (AMA) are identified using the discharge disposition indicator.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

   After all exclusions are applied, the measure randomly selects one index admission per patient per year for inclusion in the cohort so that each episode of care is mutually independent with the similar probability of the outcome. For each patient, the probability of death may increase with each subsequent admission, and therefore, the episodes of care are not mutually independent. Also, for the three-year combined data, when index admissions occur during the transition between measure reporting periods (June and July of each year) and both are randomly selected for inclusion in the measure, the measure includes only the June admission. The July admissions are excluded to avoid assigning a single death to two admissions.

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Statistical risk model

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

N/A

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of “predicted” to the number of “expected” deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital’s performance with its observed case mix, and the denominator is the number of deaths expected based on the nation’s performance with that hospital’s case mix. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital’s performance

given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the

same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed mortality rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (for example, process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure). Lastly, this measure and the NQF Inpatient Pneumonia Mortality (AHRQ) Measure #0231 are complementary rather than competing measures. Although they both assess mortality for patients admitted to acute care hospitals with a principal discharge diagnosis of pneumonia, the specified outcomes are different. This measure assesses 30-day mortality while #0231 assesses inpatient mortality. Assessment of 30-day and inpatient mortality outcomes have distinct advantages and uses which make them complementary as opposed to competing. For example, the 30-day period provides a broader perspective on hospital care and utilizes standard time period to examine hospital performance to avoid bias by differences in length of stay among hospitals. However, in some settings it may not be feasible to capture post-discharge mortality making the inpatient measure more useable. We have previously consulted with AHRQ to examine harmonization of complementary measures of mortality for patients with AMI and stroke. We have found that the measures are harmonized to the extent possible given that small differences in cohort inclusion and exclusion criteria are warranted on the basis of the use of different outcomes. However, this current measure includes patients with a principal discharge diagnosis of sepsis and a secondary discharge diagnosis of pneumonia that is present on admission. The cohort was also expanded to include patients with a principal discharge diagnosis of aspiration pneumonia. Thus, the current measure cohort is still not harmonized with measure #0231.

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 1893 and NQF 0506

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Centers for Medicare & Medicaid Services

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and older discharged from the hospital with either a principal discharge diagnosis of pneumonia (including aspiration pneumonia) or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as present on admission (POA). Readmission is defined as an unplanned readmission for any cause within 30 days of the discharge date for the index admission. Readmissions are classified as planned and unplanned by applying the planned readmission algorithm. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al.,

1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived from the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) index score at the patient nine-digit zip code level for use in studying the association between our measure and social risk factors (SRFs).

References

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_PNreadmission_Fall2020_final_7.22.20.xlsx

Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Facility

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Inpatient/Hospital

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The outcome for this measure is 30-day readmissions. We define readmission as an inpatient acute care admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients 65 and older discharged from the hospital with a principal diagnosis of pneumonia, including aspiration pneumonia or a principal diagnosis of sepsis (not severe sepsis) with a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary diagnosis of severe sepsis. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index pneumonia admission, excluding planned readmissions as defined below.

Planned Readmission Algorithm (Version 4.0)

The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare claims and VA administrative data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital.

The planned readmission algorithm has three fundamental principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/immunotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and,
3. Admissions for acute illness or for complications of care are never planned.

The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures.

In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the pneumonia measure without modifications.

The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of pneumonia, including aspiration pneumonia or a principal discharge diagnosis of sepsis (not severe sepsis) with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary discharge diagnosis of severe sepsis; and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of pneumonia, including aspiration pneumonia; or principal discharge diagnosis of sepsis (not including severe sepsis), with a secondary discharge diagnosis of pneumonia (including aspiration pneumonia) coded as POA but no secondary discharge diagnosis of severe sepsis;
2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries;
3. Aged 65 or over;
4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and,
5. Not transferred from another acute care facility.

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The 30-day pneumonia (PN) readmission measure excludes index admissions for patients:

1. Discharged against medical advice (AMA);
2. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries);

3. Admitted within 30 days of a prior index admission for pneumonia.

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.
2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.
3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The pneumonia readmission measure excludes index admissions for patients:

1. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
2. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database.

   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
3. Pneumonia admissions within 30 days of discharge from a qualifying pneumonia index admission are identified by comparing the discharge date from the index admission with subsequent admission dates.

   Rationale: Additional pneumonia admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Statistical risk model

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

N/A

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of “predicted” to the number of “expected” deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital’s performance with its observed case mix, and the denominator is the number of deaths expected based on the nation’s performance with that hospital’s case mix. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital’s performance

given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for pneumonia using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality.

The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all

patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology).

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

0506: Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

5.1 Identified measures: 0231 : Pneumonia Mortality Rate (IQI #20)

0279 : Community Acquired Pneumonia Admission Rate (PQI 11)

1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)

2579 : Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia (PN)

2882 : Excess days in acute care (EDAC) after hospitalization for pneumonia

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 1893 and NQF 1891

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization
1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS

annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day, all-cause, risk-standardized readmission rate (RSRR) for patients age 65 and over discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD. The outcome (readmission) is defined as unplanned readmission for any cause within 30 days of the discharge date for the index admission (the admission included in the measure cohort). A specified set of planned readmissions do not count in the readmission outcome. CMS annually reports the measure for patients who are 65 years or older and are enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as

inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual-eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): We used the American Community Survey (2013-2017) to derive an updated AHRQ SES index score at the patient nine-digit zip code level for use in studying the association between our measure and SRFs.

References

Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91.

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Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day readmission. We define readmission as an inpatient admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients discharged from the hospital with a principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index COPD admission, excluding planned readmissions as defined below.

Planned Readmission Algorithm (Version 4.0)

The planned readmission algorithm is a set of criteria for classifying readmissions as planned using Medicare and VA administrative claims data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital.

The planned readmission algorithm has three fundamental principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/ immunotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and,
3. Admissions for acute illness or for complications of care are never planned.

The algorithm was developed in 2011 as part of the Hospital-Wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures.

In applying the algorithm to condition- and procedure-specific measures, teams of clinical experts reviewed the algorithm in the context of each measure-specific patient cohort and, where clinically indicated, adapted the content of the algorithm to better reflect the likely clinical experience of each measure's patient cohort. The planned readmission algorithm is applied to the COPD measure without modifications.

The planned readmission algorithm and associated code tables are attached in data field S.2b (Data Dictionary or Code Table).

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The cohort includes admissions for patients aged 65 or older, who have been discharged from the hospital with either a principal discharge diagnosis of COPD OR a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD and with a complete claims history for the 12 months prior to admission.

Additional details are provided in S.9 Denominator Details.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of COPD with exacerbation;
2. Enrolled in Medicare fee-for-service (FFS) in Part A and Part B Medicare for the 12 months prior to the date of admission, and enrolled in Part A during the index admission, or those who are VA beneficiaries;
3. Aged 65 or over;
4. Discharged alive from a non-federal short-term acute care hospital or VA hospital; and,

5. Not transferred to another acute care facility.

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The 30-day COPD readmission measures exclude index admissions for patients:

1. Without at least 30 days post-discharge enrollment in FFS Medicare (in the case of patients who are not VA beneficiaries);
2. Discharged against medical advice (AMA); and,
3. Admitted within 30 days of a prior index admission for COPD.

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;
   3) if the patient has a sex other than 'male' or 'female'.

   Rationale: Reliable and consistent data are necessary for valid calculation of the measure.
2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

   Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.
3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries), which is identified with enrollment data from the Medicare Enrollment Database.

   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.

2. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3. COPD admissions within 30 days of discharge from a qualifying COPD index admission are identified by comparing the discharge date from the index admission with subsequent admission dates.

   Rationale: Additional COPD admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission does not count as both an index admission and a readmission for another index admission.

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day, all-cause, RSRRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of readmission within 30 days of discharge from the index admission using age, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix; and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, and a higher ratio indicates higher-than-expected readmission rates or worse quality.

The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of readmission. The estimated hospital-specific intercept is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet (https://qualitynet.org/inpatient/measures/readmission/methodology).

References:

Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

1891: Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)

1893 : Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2879 : Hybrid Hospital-Wide Readmission (HWR) Measure with Claims and Electronic Health Record Data

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 1893 and NQF 2888

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Centers for Medicare & Medicaid Services

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Rate of risk-standardized acute, unplanned hospital admissions among Medicare fee-for-service

(FFS) beneficiaries 65 years and older with multiple chronic conditions (MCCs) who are assigned to an Accountable Care Organization (ACO).

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Claims, Enrollment Data, Other Medicare administrative claims and enrollment data from calendar years 2017 and 2018, 2013-2017 American Community Survey, and 2017-2018 Area Health Resource File.

No data collection instrument provided Attachment NQF_ACO_MCC_DataDictionary_07.09.20.xlsx

Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Other

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Outpatient Services

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

The outcome for this measure is the number of acute unplanned hospital admissions per 100 person-years at risk for admission during the measurement period.

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Outcome Definition

The outcome for this measure is the number of acute, unplanned hospital admissions per 100 person-years at risk for admission during the measurement period.

Time Period

Number of admissions are counted while the patient is considered at risk for an admission during the measurement year.

Excluded Admissions

The numerator (outcome) does not include the following admissions because they do not reflect the quality of care provided by ambulatory care clinicians who are managing the care of MCC patients:

1. Planned hospital admissions;
2. Admissions that occur directly from a skilled nursing facility (SNF) or acute rehabilitation facility;
3. Admissions that occur within a 10-day "buffer period" of time after discharge from a hospital, SNF, or acute rehabilitation facility;
4. Admissions that occur after the patient has entered hospice;
5. Admissions related to complications of procedures or surgeries;
6. Admissions related to accidents or injuries; or
7. Admissions that occur prior to the first visit with the assigned clinician or clinician group.

Clarification regarding the 10-day "buffer period"

The 10-day "buffer period" is a numerator (or outcome) exclusion but it also affects the denominator (person-time at risk); see below in Section S.6 and S.7. The 10-day buffer period (10 days following discharge from a hospital) is a period of transition back to community-based care, and other factors in addition to ambulatory care, including care received in the hospital and post-discharge planning, contribute to the risk of admission; therefore, the measure does not hold clinicians accountable for admissions in this timeframe. This buffer period allows time for patients to be seen within 7 days of discharge as recommended in CMS's Transitional Care Management (TCM) service guidelines and for the ambulatory care provider's care plan to take effect. CMS's TCM service guidelines encourage providers to have a face-to-face visit within 7 days of discharge for Medicare patients with high medical decision complexity.

Identification of planned admissions

To identify planned admissions, the measure adopted an algorithm previously developed for CMS's hospital readmission measures, CMS's Planned Readmission Algorithm Version 4.0. [1,2] In brief, the algorithm uses the procedure codes and principal discharge diagnosis code on each hospital claim to identify admissions that are typically planned. A few specific, limited types of care are

always considered planned (for example, major organ transplant, rehabilitation, and maintenance chemotherapy). Otherwise, a planned admission is defined as a non-acute admission for a scheduled procedure (for example, total hip replacement or cholecystectomy). Admissions for an acute illness are never considered planned. For specific codes included in the planned admission algorithm, please see Tables PAA1-PAA4 with the codes for the CMS Planned Admission Algorithm in the accompanying data dictionary.

Identification of admissions that occur directly from a SNF or acute rehabilitation facility

Claims for SNF and acute rehabilitation facility stays, which help determine the outcome definition, were obtained using CMS's Integrated Data Repository (IDR).

Identification of admissions that occur after the patient has entered hospice

The status of enrollment in Medicare Parts A and B and Medicare's hospice benefit for the measurement year and the year prior were obtained from the CMS Medicare Enrollment Database.

Identification of admissions related to complications of procedures or surgeries (including small bowel obstruction), and accidents or injuries

Using the Agency for Healthcare Research and Quality's (AHRQ's) Clinical Classifications Software (CCS), which clusters diagnoses into clinically meaningful categories using International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes, we exclude from the outcome admissions related to the following 23 CCS categories. For specific ICD codes included, please refer to AHRQ's CCS Version 2019.1, Fiscal Year 2020.

a) Complications of procedures or surgeries

1. 145: Intestinal obstruction without hernia
2. 237: Complication of device; implant or graft
3. 238: Complications of surgical procedures or medical care
4. 257: Other aftercare

b) Accidents or injuries

5. 2601 E Codes: Cut/pierce
6. 2602 E Codes: Drowning/submersion
7. 2604 E Codes: Fire/burn
8. 2605 E Codes: Firearm
9. 2606 E Codes: Machinery
10. 2607 E Codes: Motor vehicle traffic (MVT)
11. 2608 E Codes: Pedal cyclist; not MVT
12. 2609 E Codes: Pedestrian; not MVT
13. 2610 E Codes: Transport; not MVT
14. 2611 E Codes: Natural/environment
15. 2612 E Codes: Overexertion
16. 2613 E Codes: Poisoning

17. 2614 E Codes: Struck by; against
18. 2615 E Codes: Suffocation
19. 2616 E Codes: Adverse effects of medical care
20. 2618 E Codes: Other specified and classifiable
21. 2619 E Codes: Other specified; NEC
22. 2620 E Codes: Unspecified
23. 2621 E Codes: Place of occurrence

Citations

1. Yale New Haven Health Services Corporation – Center for Outcomes Research & Evaluation (YNHHSC/CORE). 2018 All-Cause Hospital Wide Measure Updates and Specifications Report - Hospital-Level 30-Day Risk-Standardized Readmission Measure – Version 7.0. Centers for Medicare & Medicaid Services; March 2018.
2. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Patients included in the measure (target patient population)

The target patient population for the outcome includes Medicare FFS patients aged 65 years and older with multiple chronic conditions (MCCs).

Attribution:

The outcome is attributed to the ACO to which the patient is assigned. (More details are provided in the next section.)

Person-time at risk

Persons are considered at risk for hospital admission if they are alive, enrolled in FFS Medicare, and not in the hospital during the measurement period. In addition to time spent in the hospital, we also exclude from at-risk time: 1) time spent in a SNF or acute

rehabilitation facility; 2) the time within 10 days following discharge from a hospital, SNF, or acute rehabilitation facility; and 3) time after entering hospice care.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Patients included in the measure (target patient population)

The cohort, or group of patients included in the measure, is comprised of patients whose combinations of chronic conditions put them at high risk of admission and whose admission rates could be lowered through better care. This definition reflects NQF's "Multiple Chronic Conditions Measurement Framework," which defines patients with MCCs as people "having two or more concurrent chronic conditions that … act together to significantly increase the complexity of management, and affect functional roles and health outcomes, compromise life expectancy, or hinder self-management." [1]

The specific inclusion criteria are as follows:

1. Patient is alive at the start of the measurement period and has two or more of nine chronic condition disease groups in the year prior to the measurement period.

Chronic conditions, except for diabetes, are defined using CMS's Chronic Conditions Data Warehouse (CCW). For diabetes, we used the diabetes cohort definition from the Accountable Care Organization (ACO) diabetes admission measure developed by CORE (v2018a ACO-36) as opposed to the definition used in CCW, which includes diagnoses for secondary and drug-induced diabetic conditions that are not the focus of the MIPS MCC admission measure. See Table 1 in the accompanying data dictionary for the specific codes used to define the nine cohort-qualifying conditions.

1. Acute myocardial infarction (AMI),
2. Alzheimer's disease and related disorders or senile dementia,
3. Atrial fibrillation,
4. Chronic kidney disease (CKD),

5. Chronic obstructive pulmonary disease (COPD) or asthma,
6. Depression,
7. Diabetes,
8. Heart failure, and
9. Stroke or transient ischemic attack (TIA).

Rationale: As noted above, this definition of MCCs is consistent with NQF's "Multiple Chronic Conditions Measurement Framework" and except for diabetes, is the same as the original ACO MCC measure [2]. Diabetes was added as a cohort-qualifying condition based on input from our TEP for the MIPS version of this measure, and further guidance from CMS. The inclusion of diabetes acknowledges the complexity that diabetes introduces to caring for patients with MCCs.

2. Patient is aged =65 years at the start of the year prior to the measurement period.

Rationale: Younger Medicare patients represent a distinct population with dissimilar characteristics and outcomes. Additionally, these patients tend to cluster among certain providers. These factors make risk adjustment difficult.

3. Patient is a Medicare FFS beneficiary with continuous enrollment in Medicare Parts A and B during the year prior to the measurement period.

Rationale: Enrollment is necessary to provide clinical information for cohort identification

and risk adjustment.

4. Patient is attributed to a Medicare Shared Savings Program ACO.

Rationale: This measure is designed for ACOs that are part of MSSP and thus includes patients with MCCs who are attributed to one of the MSSP ACOs. The outcome is attributed to the ACO to which the patient is assigned. Patients are assigned to ACOs according to the specific ACO program assignment algorithm. This measure is limited to ACOs that are part of the Medicare Shared Savings Program (MSSP)where patients are retrospectively assigned to an ACO if they obtained the plurality of their primary care through the ACO's providers during the measurement year. Information on ACO beneficiary assignment can be found here: https://www.cms.gov/Medicare/Medicare-Feefor-Service-Payment/sharedsavingsprogram/Downloads/Shared-Savings-Losses-Assignment-Spec-V6.pdf.

Citations

1. National Quality Forum. Multiple Chronic Conditions Measurement Framework. http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=71227. Accessed February 20, 2019.
2. Drye EE, Altaf FK, Lipska KJ et al. Defining Multiple Chronic Conditions for Quality Measurement. Med Care. 2018; 56(2):193-201.

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

The measure excludes the following patients:

1. Patients without continuous enrollment in Medicare Part A or B during the measurement period.
2. Patient enrolled in hospice at any time during the year prior to the measurement year or at the start of the measurement year.
3. Patients without any visits with any of the TINs associated with the attributed ACO during the measurement year or the year prior to the measurement year.
4. Patients not at risk for hospitalization during the measurement year.

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met 1) the patient's age is greater than 115 years: 2) if the discharge date for a hospitalization is before the admission date; 3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

The rationale for each exclusion is provided below:

1. Patients without continuous enrollment in Medicare Part A or B during the measurement period.

Rationale: The measure excludes these patients to ensure full data availability for outcome assessment and attribution.

2. Patients enrolled in hospice during the year prior to the measurement year or at the start of the measurement year.

Rationale: The measure excludes these patients even though once a patient enters hospice care, a goal of care is to prevent the need for hospital care. However, it may be difficult to influence end-of-life care once a patient is enrolled in hospice and served by a hospice team.

3. Patients without any visits (Evaluation & Management [E&M] or other) with any of the TINs associated with the attributed ACO during the measurement year and the year prior to the measurement year.

Rationale: These patients are excluded because the start of their time-at-risk cannot be ascertained.

4. Patients not at risk for hospitalization at any time during the measurement year.

Rationale: The outcomes for these patients cannot be assessed as they are not at risk. For example, if the first visit to the attributed ACO occurred after the patient has entered hospice, the patient would not have any time at risk and would thus be excluded. See section 2.4.3 of the attached MIPS MCC technical report for methods used to calculate person-time at risk.

Clarification of 10-day buffer period:

The 10-day "buffer period" is a numerator (or outcome) exclusion (see section S.5) but it also affects the denominator (person-time at risk). Persons are considered at risk for hospital admission if they are alive, enrolled in FFS Medicare, and not in the hospital during the measurement period. In addition to time spent in the hospital, we also exclude from at-risk time: 1) time spent in a SNF or acute rehabilitation facility; 2) the time within 10 days following discharge from a hospital, SNF, or acute rehabilitation facility; and 3) time after entering hospice care. Note that the patient is not removed from the denominator, we are just subtracting the 10-days of person-time.

The 10-day buffer period (10 days following discharge from a hospital) is a period of transition back to community-based care, and other factors in addition to ambulatory care, including care received in the hospital and post-discharge planning, contribute to the risk of admission; therefore, the measure does not hold clinicians accountable for admissions in this timeframe. This buffer period allows time for patients to be seen within 7 days of discharge as recommended in CMS's Transitional Care Management (TCM) service guidelines and for the ambulatory care provider's care plan to take effect. CMS's TCM service guidelines encourage providers to have a face-to-face visit within 7 days of discharge for Medicare patients with high medical decision complexity.

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Statistical risk model

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Not applicable. This measure is not stratified.

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

We begin by identifying the cohort of MCC patients by applying the inclusion/exclusion criteria. We use MSSP ACO assignment to identify MCC patients attributed to MSSP ACOs. The number of admissions and time at risk in the measurement period are then calculated for each patient based on our measure specifications. The measure is risk-adjusted for demographic, clinical, and social risk factors. For the score calculation, the measure uses a hierarchical (two-level) statistical model that accounts for the clustering of patients within ACOs and accommodates the varying patient sample sizes of different providers. The measure uses a negative binomial with linear variance (NB-1) model since the measure's outcome is a count of the number of admissions for MCC patients during the measurement period. The first level of the model adjusts for patient factors. The relationship between patient risk factors and the outcome of admissions is determined based on all patients attributed to ACOs. Therefore, the "expected" number of admissions (described below) for each ACO is based on the performance of all ACOs in the MSSP program, nationwide.

The second level of the model estimates a random-intercept term that reflects the ACO's contribution to admission risk, based on their actual admission rate, the performance of other providers, their case mix, and their sample size.

The measure score is a risk-standardized acute admission rate (RSAAR), calculated as the ratio of the number of predicted admissions to the number of expected admissions multiplied by the crude national rate. The predicted to expected ratio of admissions is analogous to an observed over expected ratio, but the numerator accounts for clustering, sample-size variation, and provider-specific performance. The expected number of admissions is calculated based on the provider's case mix and average intercept among all MSSP ACOs. The predicted number of admissions is calculated based on the provider's case mix and the estimated provider-specific random intercept term. We multiply the predicted to expected ratio for each provider by a constant – the crude rate of acute, unplanned admissions among all MSSP ACOs – for ease of interpretation.

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

2888: Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

5.1 Identified measures: 3597 : Clinician-Group Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions under the Merit-based Incentive Payment System

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: Clinician-Group Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions under the Merit-based Incentive Payment System (MIPS MCC measure): The measure specifications are harmonized to the fullest extent possible. The only differences are for the CMS programs and measurement levels for which they are intended: for example, the MIPS measure is attributed and scored for clinician groups under MIPS, and the ACO MCC admission measure is attributed and scored for Medicare ACOs. Hospitalizations for Ambulatory Care Sensitive Conditions for Dual-Eligible Beneficiaries Unlike this updated measure which is specified for evaluating ACOs, the

ACSC DE measure is a state-level measure. The cohorts, outcomes, and the risk-adjustment models differ accounting for differences in their target populations and measurement settings. -Cohort: Unlike the ACO MCC measure which targets patients with two or more of eight chronic conditions age >65 years, the ACSC DE measure targets dual-eligible adults age >18 years within each state; it does not focus on patients with certain chronic conditions. -Outcome: Unlike the ACO MCC measure which targets unplanned admissions, the ACSC DE measure is a composite of ACSC admissions. The ACSC DE measure outcome is ACSC admissions per 1,000 beneficiaries for ACSC by chronic, acute, and both conditions -Risk adjustment: Like the ACO MCC measure, the ACSC DE measure is risk-adjusted. Both measures adjust for patient demographics and comorbidities defined by Condition Categories (CCs). Specifically, the ACSC measure adjusts for age and sex, comorbidities, condition interactions, disability-by-condition interactions, and the total number of conditions.

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 1893 and NQF 3502

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Centers for Medicare & Medicaid Services

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date for patients who are between the ages of 50 and 94.

Please note that in parallel with the hybrid HWM measure, we are submitting a claims-only HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e).

Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure.

Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment).

Differences in the measure, data, and testing that reflect limitations in data availability

1. Dataset used for development, some testing (see below for differences), and measure results:
    a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database.
    b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information.
2. Age of patients in cohort:
    a. The claims-only measure includes Medicare FFS patients, age 65-94.
    b. The hybrid measure includes all patients age 50-94 (see later discussion for justification)
3. External empiric validity testing
    a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
4. Socioeconomic risk factor analyses
    a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
5. Exclusion analyses
    a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure.
6. Meaningful differences
    a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure.

Difference between the two measures when fully harmonized, prior to implementation:

1. Risk adjustment:
    a. The claims-only measure uses administrative claims data only for risk adjustment
    b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Claims, Electronic Health Records, Other Clinical-Hybrid Dataset

Constructed using Kaiser Permanente Northern California matched administrative claims and electronic health record (EHR) data, admission dates from October 1, 2015 – December 30, 2016. This data source was used for measure testing. (An earlier Kaiser dataset from that included all admissions for adult patients to any of their member hospitals between January 1, 2009 and June 30, 2015 was used for measure development, as described in the attached methodology report).

The two data sources listed below were used for testing the claims-based measure; the hybrid testing form includes some testing data from the claims-based measure (for example, for the social risk factor and external validation analyses).

HWM claims-only datasets:

Medicare Part A Inpatient Claims Data

The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission. This data was used along with the Medicare Enrollment Database (EDB) for testing the claims-based measure.

Medicare Enrollment Database (EDB)

This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment.

No data collection instrument provided Attachment Del18b2HOP5HWMHybridDataDictionary01072019.xlsx

Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Facility

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Inpatient/Hospital, Other Home-based primary care and home-based palliative care); Settings include: Home, Boarding home, Domiciliary, Assisted Living Facilities, Rest Home or Custodial Care Services

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure outcome is death from any cause within 30 days of the admission date of the index admission. The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The cohort includes inpatient admissions for a wide variety of conditions for patients aged between 50 and 94 years old who were discharged from short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details. The age range for this measure differs from that of the claims-only measure due to the limited size of the dataset used for testing. The intent is to harmonize the age range of the hybrid measure with the age range of the claims-only measure, so that both will include admissions for patients age 65-94.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The index cohort includes all inpatient admissions for patients aged 50-94 years old. (Note: The intention is to fully harmonize the cohort definition with the claims-only measure so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing due to the limited dataset available that included the EHR data elements needed to calculate this measure. Note that the risk model already includes age in years, as a risk variable.)

An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients:

1. Not transferred from another acute care facility

Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any “transfer-in” hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission).

2. Aged between 50 and 94 years

The hybrid measure is intended for the Medicare FFS population but was tested in a limited dataset due to the EHR data elements included. The use of a small dataset required that we expand the sample by including admissions from patients ages 50 to 94 years. Note that the measure already adjusts for age.

3. Not admitted for primary psychiatric diagnoses

   Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab).

4. Not admitted for rehabilitation

   Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab).

5. Not enrolled in hospice at the time of, or 12 months prior to, their index admission

   Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal

6. Not enrolled in hospice within two days of admission

   Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received.

7. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission

   Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab).

8. Without any diagnosis of metastatic cancer

   Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab).

9. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival

   Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list.

   In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions

and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure.

The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability.

The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure; 2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams.

The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures.

For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel.

The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions.

The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure excludes index admissions for patients:

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data;
2. Discharged against medical advice (AMA);
3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and
4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;
   3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data.

   Rationale: The measure does not include stays for patients where the admission date is after the date of death, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data.

2. Discharged against medical advice (AMA)

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240).

   Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals.

4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.

   Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded.

   Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Statistical risk model

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

N/A

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The "predicted" number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The "expected" number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all

patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique.

Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of “predicted” deaths to the number of “expected” deaths at a given hospital. The predicted number of deaths is based on the hospital’s performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation’s performance with that hospital’s case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows a particular hospital’s performance, given its case mix and service mix, to be compared to an average hospital’s performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality.

To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period.

The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. (Note that in the case of the hybrid measure, we are presenting data from 9 of the total 15 divisions due to

limitations in availability of electronic health records data). The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

3502: Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: This hybrid HWM measure incorporates patient-level clinical data from the EHR into the risk adjustment model, compared to the claims-only hospital-wide mortality measure. This hybrid HWM measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring

mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer, whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include as many have survival as their primary goal, however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into in order to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into six categories, or "specialty cohorts", while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. HWM captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures.

5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

Comparison of NQF 1893 and NQF 3504

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Steward

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Centers for Medicare & Medicaid Services

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Centers for Medicare & Medicaid Services

Description

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates a hospital-level 30-day risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for patients discharged from the hospital with either a principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD. CMS annually reports the measure for patients who are 65 years or older and enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are patients hospitalized in Veterans Health Administration (VA) facilities.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates a hospital-level 30-day hospital-wide risk-standardized mortality rate (RSMR), defined as death from any cause within 30 days after the index admission date, for Medicare fee-for-service (FFS) patients who are between the ages of 65 and 94.

Please note that in parallel with the claims-only HWM measure, we are submitting a hybrid HWM measure. Note that ultimately the claims and hybrid measures will be harmonized and use the same exact cohort specifications. The intent is that prior to implementation, the two measures will be exactly the same, with the exception of the additional risk adjustment added by the CCDE in the hybrid measure. This is analogous to the currently endorsed and implemented hybrid hospital-wide readmissions measure (NQF 1789 and NQF 2879e).

Because of the homology between the claims and hybrid HWM measures, there is no reason to suspect that the results of analyses done for the claims-only measure would differ in any significant way from results of analyses for a nationally representative hybrid measure.

Below we highlight the differences between the two measures, including specifications, data used, and testing which reflect limitations of data availability, as well as actual intended differences in the measure (risk adjustment).

Differences in the measure, data, and testing that reflect limitations in data availability

1. Dataset used for development, some testing (see below for differences), and measure results:
    a. The claims-only measure uses nation-wide Medicare FFS claims and the enrollment database.
    b. The hybrid measure uses an electronic health record (EHR) database from 21 hospitals in the Kaiser Permanente network which includes inpatient claims data information.
2. Age of patients in cohort:
    a. The claims-only measure includes Medicare FFS patients, age 65-94.
    b. The hybrid measure includes all patients age 50-94 (see later discussion for justification)
3. External empiric validity testing
    a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.

4. Socioeconomic risk factor analyses
    a. Not possible for the hybrid measure, due to limited data availability. We provide results from the claims-only measure within the hybrid testing form.
5. Exclusion analyses
    a. To be representative of what we expect the impact would be of the measures' exclusions in a nation-wide sample, we provide the results from the claims-only measure.
6. Meaningful differences
    a. To be representative of what we expect the range of performance would be in a nation-wide sample, we provide the distribution results from the claims-only measure.

Difference between the two measures when fully harmonized, prior to implementation:

1. Risk adjustment:
    a. The claims-only measure uses administrative claims data only for risk adjustment
    b. The hybrid measure adds 10 clinical risk variables, derived from a set of core clinical data elements (CCDE) extracted from the EHR.

Type

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Outcome

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Outcome

Data Source

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

Medicare Part A Inpatient and Part B Outpatient Claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission.

Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The Master Beneficiary Summary File (MBSF) is an annually created file derived the EDB that contains enrollment information for all Medicare beneficiaries including dual eligible status. Years 2016-2019 were used.

Veterans Health Administration (VA) Data: This data source contains data for VA inpatient and outpatient services including: inpatient hospital care, outpatient hospital services, skilled nursing facility care, some home health agency services, as well as inpatient and outpatient physician data for the 12 months prior to and including each index admission. Unlike Medicare FFS patients, VA patients are not required to have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission.

The American Community Survey (2013-2017): The American Community Survey data is collected annually and an aggregated 5-years data were used to calculate the Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) composite index score.

References:

Fleming C, Fisher ES, Chang CH, Bubolz TA, Malenka DJ. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs hospitals. Medical Care. 1992; 30(5): 377-91.

No data collection instrument provided Attachment NQF_datadictionary_COPDmortality_Fall2020_final_7.22.20.xlsx

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Claims, Enrollment Data, Other Data sources for the Medicare FFS measure:

1. Medicare Part A Inpatient: The index dataset contains administrative inpatient hospitalization data for Medicare FFS beneficiaries, aged 65-94 on admission, hospitalized from July 1, 2016-June 30, 2017. The history dataset includes administrative inpatient hospitalization data on each patient for the 12 months prior to the index admission.
2. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. It was also used to determine hospice enrollment.

No data collection instrument provided Attachment Del18b1HOP5HWMClaimsDataDictionary01072019.xlsx

Level

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Facility

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Facility

Setting

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Inpatient/Hospital

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Inpatient/Hospital

Numerator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The outcome for this measure is 30-day all-cause mortality. We define mortality as death from any cause within 30 days from the date of admission for patients hospitalized with either a principal diagnosis of COPD or a principal diagnosis of respiratory failure with a secondary diagnosis of acute exacerbation of COPD.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The outcome for this measure is 30-day, all-cause mortality. Mortality is defined as death from any cause, either during or after admission, within 30 days of the index admission date.

Numerator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure counts all deaths (including in-hospital deaths) for any cause within 30 days of the date of the index COPD admission.

Identifying deaths in the FFS measure

As currently reported, we identify deaths for FFS Medicare patients 65 years and older in the Medicare Enrollment Database (EDB) and for VA patients in the VA data.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure outcome is death from any cause within 30 days of the admission date of the index admission, for Medicare FFS patients identified using the Medicare Enrollment Database (EDB). The numerator is a binary variable (1=yes/0=no) that indicates whether the patient died within 30 days of the index admission date.

Denominator Statement

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

This claims-based measure is used for a cohort of patients aged 65 years or older.

The cohort includes admissions for patients aged 65 years and older discharged from the hospital with a principal discharge diagnosis of COPD and with a complete claims history for the 12 months prior to admission. The measure is publicly reported by CMS for those patients 65 years and older who are Medicare FFS or VA beneficiaries admitted to non-federal or VA hospitals, respectively.

Additional details are provided in S.7 Denominator Details.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The cohort includes inpatient admissions for a wide variety of conditions for Medicare FFS patients aged between 65 and 94 years old who were admitted to short-term acute care hospitals. If a patient has more than one admission during the measurement year, one admission is randomly selected for inclusion in the measure. Additional details are provided in S.7 Denominator Details.

Denominator Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

To be included in the measure cohort used in public reporting, patients must meet the following inclusion criteria:

1. Principal discharge diagnosis of COPD or a principal discharge diagnosis of respiratory failure with a secondary discharge diagnosis of acute exacerbation of COPD
2. Enrolled in Medicare fee-for-service (FFS) Part A and Part B for the 12 months prior to the date of the index admission and Part A during the index admission, or those who are VA beneficiaries
3. Aged 65 or over
4. Not transferred from another acute care facility.

This measure can also be used for an all-payer population aged 40 years and older. We have explicitly tested the measure in both patients aged 40+ years and those aged 65+ years (see Testing Attachment for details).

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

An index admission is the hospitalization to which the mortality outcome is attributed and includes admissions for patients:

1. Enrolled in Medicare FFS Part A for at least 12 months prior to the date of admission and during the index admission

Rationale: Claims data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment criterion ensures a full year of administrative data is available for risk adjustment.

2. Not transferred from another acute care facility

Rationale: Admissions to an acute cate hospital within one day of discharge from another acute care hospital are considered transfers. Transferred patients are included in the measure cohort, but it is the initial hospitalization rather than any “transfer-in” hospitalization(s), that is included as the hospitalization to which the mortality outcome is attributed (the index admission).

3. Aged between 65 and 94 years

Rationale: Medicare patients younger than 65 are not included in the measure because they usually qualify for the program due to severe disability and are considered to be clinically distinct from Medicare patients 65 and over. Patients over age 94 are not included to avoid holding hospitals responsible for the survival of the very elderly patients, who may be less likely to have survival as a primary goal.

Note that the hybrid measure (submitted for NQF endorsement in parallel with the claims-only measure) differs from the claims-only measure in terms of the age range of included admissions; the hybrid measure includes all inpatient admissions for patients aged 50-94 years old. The intention is to fully harmonize the cohort definitions for the two measures, so that both measures will capture admissions for patients age 65-94. We deviated from that definition during development and testing for the hybrid measure due to the limited dataset available that included the EHR data elements needed to calculate the hybrid measure. Note that the risk model already includes age in years, as a risk variable.)

4. Not admitted for primary psychiatric diagnoses

   Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric facilities that are not comparable to short-term acute care hospitals (see data dictionary, HWM Non-Acute Care Inclusion tab).

5. Not admitted for rehabilitation

   Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care (see data dictionary, HWM Non-Acute Care Inclusion tab).

6. Not enrolled in hospice at the time of, or 12 months prior to, their index admission

   Rationale: Patients enrolled in hospice in the prior 12 months or at the time of admission are unlikely to have 30-day survival as a primary goal.

7. Not enrolled in hospice within two days of admission

   Rationale: There is not a single, correct approach regarding patients enrolled in hospice during admission or upon discharge – mortality may or may not represent a quality signal for this group of patients and hospice enrollment is inadequate to differentiate this issue. However, for most patients and/or families who had the discussion and agreed to enroll in hospice within two days of admission, 30-day survival is not likely the primary goal due to their condition and not the quality of care received.

8. Not with a principal diagnosis of cancer and enrolled in hospice during their index admission

   Rationale: Patients admitted primarily for cancer who are enrolled in hospice during admission are unlikely to have 30-day survival as a primary goal of care. (see data dictionary, HWM Cancer Inclusion tab).

9. Without any diagnosis of metastatic cancer

   Rationale: Although some patients admitted with a diagnosis of metastatic cancer will have 30-day survival as a primary goal of care, for many such patients admitted to the hospital, death may be a clinically reasonable and patient-centered outcome. (see data dictionary, HWM Metastatic Cancer Inclusion tab).

10. Not with a principal discharge diagnosis, or a secondary diagnosis that is present on admission (POA) for a condition which hospitals have limited ability to influence survival

    Rationale: Hospitals have little ability to impact mortality for some conditions. This list of conditions (see data dictionary, HWM ICD-10 Inclusion tab) was determined through independent review, by several clinicians, of conditions associated with high mortality. The decisions were also reviewed with our Technical Expert Panel (TEP) and Technical Work Group. Admissions are not

included in the cohort if the patient had a principal diagnosis code that is on this list, or a secondary code with POA that is on the list.

In addition, for patients with multiple admissions, the measure selects only one admission, at random, for inclusion. There is no practical statistical modeling approach that can account or adjust for the complex relationship between the number of admissions and risk of mortality in the context of a hospital-wide mortality measure. Random selection ensures that providers are not penalized for a "last" admission during the measurement period; selecting the last admission would not be as accurate a reflection of the risk of death as random selection, as the last admission is inherently associated with a higher mortality risk. Random selection is also used in CMS's condition-specific mortality measures. Note that random selection reduces the number of admissions, but does not exclude any patients from the measure.

The cohort is defined using ICD-10 Clinical Modification codes identified in Medicare Part A Inpatient claims data. The measure aggregates the ICD-10 principal diagnosis and all procedure codes of the index admission into clinically coherent groups of conditions and procedures (condition categories or procedure categories) using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications System (CCS). There is a total of 285 mutually exclusive AHRQ condition categories, most of which are single, homogenous diseases such as pneumonia or acute myocardial infarction. Some are aggregates of conditions, such as "other bacterial infections". There is a total of 231 mutually exclusive procedure categories. Using the AHRQ CCS procedure and condition categories, the measure assigns each index hospitalization to one of 15 mutually exclusive divisions. The divisions were created based upon clinical coherence, consistency of mortality risk, adequate patient and hospital case volume for stable results reporting, and input from clinicians, patients, and patient caregivers on usability.

The measure first assigns admissions with qualifying AHRQ procedure categories to one of six surgery divisions by identifying a defining surgical procedure. The defining surgical procedure is identified using the following algorithm: 1) if a patient only has one major surgical procedure then that procedure is the defining surgical procedure; 2) if a patient has more than one major surgical procedure, the first dated procedure performed during the index admission is the defining surgical procedure; 3) if there is more than one major surgical procedure on that earliest date, the procedure with the highest mortality rate is the defining surgical procedure. These divisions include admissions likely cared for by surgical teams.

The surgical divisions are: Surgical Cancer (see note below), Cardiothoracic Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, and Other Surgical Procedures.

For the Surgical Cancer division, any admission that includes a surgical procedure and a principal discharge diagnosis code of cancer is assigned to the Surgical Cancer division. This division and the logic behind it was implemented in response to feedback from our Technical Expert Panel.

The measure then assigns the remaining admissions into one of the nine non-surgical divisions based on the AHRQ diagnostic CCS of the principal discharge diagnosis. The non-surgical divisions are: Cancer, Cardiac, Gastrointestinal, Infectious Disease, Neurology, Orthopedic, Pulmonary, Renal, Other Conditions.

The full list of the specific diagnosis and procedure AHRQ CCS categories used to define the divisions are attached in the Data Dictionary.

Exclusions

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The mortality measures exclude index admissions for patients:

1. With inconsistent or unknown vital status or other unreliable demographic (age and gender) data;
2. Enrolled in the Medicare hospice program or used VA hospice services any time in the 12 months prior to the index admission, including the first day of the index admission; or
3. Discharged against medical advice (AMA).

For patients with more than one admission for a given condition in a given year, only one index admission for that condition is randomly selected for inclusion in the cohort for each year.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure excludes index admissions for patients:

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data;
2. Discharged against medical advice (AMA);
3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240); and
4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions within the measurement year.

Exclusion Details

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

1. Inconsistent vital status or unreliable data are identified if any of the following conditions are met
   1) the patient's age is greater than 115 years:
   2) if the discharge date for a hospitalization is before the admission date;
   3) if the patient has a sex other than 'male' or 'female'.

Rationale: Reliable and consistent data are necessary for valid calculation of the measure.

2. Hospice enrollment in the 12 months prior to or on the index admission is identified using hospice data.

Rationale: These patients are likely continuing to seek comfort measures only; thus, mortality is not necessarily an adverse outcome or signal of poor quality care.

3. Discharges against medical advice (AMA) are identified using the discharge disposition indicator in claims data.

Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

1. With inconsistent or unknown vital status (from claims data) or other unreliable claims data

   Rationale: The measure does not include stays for patients where the admission date is after the date of death in the Medicare Enrollment Database, or where the date of death occurs before the date of discharge but the patient was discharged alive because these are likely errors in the data.

2. Discharged against medical advice (AMA)

   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.

3. With an admission for spinal cord injury (CCS 227), skull and face fractures (CCS 228), Intracranial Injury (CCS 233), Crushing injury or internal injury (CCS 234), Open wounds of head/neck/trunk (CCS 235), and burns (CCS 240)

   Rationale: Even though a hospital likely can influence the outcome of some of these conditions, in many cases death events are not a signal of poor quality of care when patients present with these conditions. These conditions are also infrequent events that are unlikely to be uniformly distributed across hospitals.

4. With a principal discharge diagnosis within a CCS with fewer than 100 admissions in that division within the measurement year.

   Rationale: To calculate a stable and precise risk model, there are a minimum number of admissions that are needed. In addition, a minimum number of admissions and/or outcome events are required to inform grouping admissions into larger categories. These admissions present challenges to both accurate risk prediction and coherent risk grouping and are therefore excluded.

   Note: During measure development we analyzed different volume cut-offs (25, 50 and 100). Using cut-off values below 100 resulted in too many CCS codes in some of the divisions (the CCS category codes are used in risk adjustment) which resulted in non-convergence of those division-level risk models. The total number of patients excluded is very small (13,597 or 0.21% of admissions for a cut off of 100). During measure development we also explored the option of pooling low-volume CCS codes (CCS<100 patients) into one group, however, the heterogeneity in mortality rates for the individual ICD-10 codes in those groups would preclude adequate risk adjustment. The TEP supported excluding these admissions.

Risk Adjustment

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Statistical risk model

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Statistical risk model

Stratification

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

N/A

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

N/A

Type Score

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

Rate/proportion better quality = lower score

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

Rate/proportion better quality = lower score

Algorithm

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

The measure estimates hospital-level 30-day all-cause RSMRs following hospitalization for COPD using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals (Normand and Shahian, 2007). At the patient level, it models the log-odds of mortality within 30 days of index admission using age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a mortality at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSMR is calculated as the ratio of the number of "predicted" to the number of "expected" deaths at a given hospital, multiplied by the national observed mortality rate. For each hospital, the numerator of the ratio is the number of deaths within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator is the number of deaths expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, and a higher ratio indicates higher-than-expected mortality rates or worse quality.

The “predicted” number of deaths (the numerator) is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific intercept on the risk of mortality. The estimated hospital-specific intercept is added coefficients multiplied by the patient characteristics. The results are transformed and summed over all patients attributed to a hospital to get a predicted value. The “expected” number of deaths (the denominator) is obtained in the same manner, but a common intercept using all hospitals in our sample is added in place of the hospital-specific intercept. The results are transformed and summed over all patients in the hospital to get an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

This calculation transforms the ratio of predicted over expected into a rate that is compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in the original methodology report posted on QualityNet: https://qualitynet.org/inpatient/measures/mortality/methodology.

References:

1. Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. Stat Sci 22(2): 206-226.

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

The measure estimates hospital-level, risk-standardized mortality rates (RSMRs) within 30 days of hospital admission using hierarchical logistical regression models through a Bayesian Markov Chain Monte Carlo (MCMC) procedure. In brief, we used hierarchical logistic regression to model the log-odds of mortality for each of the 15 service-line divisions. Death within 30 days was modeled as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. We estimated a separate hierarchical logistic regression model for each service-line division. In order to obtain the variance and interval estimates, we fit the hierarchical model under the Bayesian framework along with the Markov Chain Monte Carlo (MCMC) technique.

Admissions are assigned to one of 15 mutually exclusive divisions (groups of discharge condition categories and procedure categories). For each division and each hospital with patients in that division, the standardized mortality ratio (SMR) is calculated as the ratio of the number of “predicted” deaths to the number of “expected” deaths at a given hospital. The predicted number of deaths is based on the hospital’s performance with its observed case mix and service mix, and is calculated by using the coefficients estimated by regressing the risk factors and the hospital-specific effect on the risk of mortality. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are transformed via an inverse logit function and summed over all patients attributed to a hospital to get a predicted value. The expected number of deaths is based on the nation’s performance with that hospital’s case mix and service mix and is obtained in the same manner, but a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are transformed via an inverse logit function and summed over all patients in the hospital to get an expected value. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows a particular hospital’s performance, given its case mix and service mix, to be compared to an average hospital’s performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected mortality rates or better quality, while a higher ratio indicates higher-than-expected mortality rates or worse quality.

To assess hospital performance for each reporting period, the measure re-estimates the model coefficients using the data in that period.

The division-level SMRs are then pooled for each hospital using an inverse variance-weighted geometric mean to create a hospital-wide composite SMR. The hospital-wide SMR is then multiplied by the national observed mortality rate to produce the RSMR.

Submission items

1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1 Identified measures: 0468 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0275 : Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 05)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

2888 : Accountable Care Organization Risk-Standardized Acute Hospital Admission Rate for Patients with Multiple Chronic Conditions

3502 : Hybrid Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

3504 : Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: We did not include in our list of related measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Additionally, the measure, with the specified cohort, has been publicly reported since 2008. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because they typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b.1 If competing, why superior or rationale for additive value: N/A

3504: Claims-Only Hospital-Wide (All-Condition, All-Procedure) Risk-Standardized Mortality Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: This claims-only hospital-wide mortality (HWM) measure is intended to complement the existing CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789) to

allow assessment of trends in hospital performance for both readmission and mortality outcomes, similar to other complementary pairs of readmission and mortality measures for specific conditions and procedures. By measuring mortality outcomes across almost all hospitalized patients, this measure will provide an important additional performance assessment that will complement condition- and procedure-specific or other more narrowly defined mortality measures and allow a greater number of patients and hospitals to be evaluated. This HWM measure captures a similarly broad cohort to the CMS Hospital-Wide All-Cause Risk-Standardized Readmission Measure (NQF #1789), and a broader cohort than those of other CMS condition-specific measures. Because the mortality measure is focused on a different outcome, it differs from the existing CMS Hospital-Wide All-Cause Risk Standardized Readmission Measure (NQF #1789) in a couple of ways. First, this HWM measure includes patients with a principal discharge diagnosis of cancer (with some exceptions), whereas those patients are not included in the readmission measure. Cancer patients are appropriate to include in the HWM measure as many have survival as their primary goal; however due to cancer treatment plans, readmissions are frequently part of the plan and expected and therefore, are not a reasonable signal of quality. Another difference between the two measures is the number of divisions or specialty cohorts the patients are divided into, to more accurately risk adjust for case-mix and service-mix. The readmission measure divides patients into five categories, or "specialty cohorts", while the mortality measure uses 15. This is because the risk of mortality is much more closely related to patient factors than readmission is related to patient factors. PSI-02 (NQF #0357) is another complementary mortality measure, which captures a different patient population and a different outcome compared with the HWM measure submitted with this application. PSI-02 captures patients 18 years of age or older, or obstetric patients, whereas the HWM measure captures patients between the ages of 65 and 94. PSI-02 captures DRGs with less than 0.5% mortality rate, whereas the HWM measure captures all patients within all CCSs, regardless of mortality rate. Hospital-wide mortality captures mortality up to 30 days past admission, where AHRQ PSI-02 only captures in-hospital mortality. IQI 90 (NQF #0530) is another complimentary mortality measure, which is a composite measure of the number of in-hospital deaths for a narrow range of conditions (CHF, stroke, hip fracture, pneumonia, acute myocardial infarction and GI hemorrhage). The HWM measure presented in this application captures all deaths after 30 days of admission, for all conditions and procedures.

5b.1 If competing, why superior or rationale for additive value: There are no competing NQF-endorsed measures.

Comparison of NQF 2993 and NQF 0022

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)
0022: Use of High-Risk Medications in Older Adults (DAE)

Steward

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

National Committee for Quality Assurance

0022: Use of High-Risk Medications in Older Adults (DAE)

National Committee for Quality Assurance

Description

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

The percentage of patients 65 years of age and older who have evidence of an underlying disease, condition or health concern and who are dispensed an ambulatory prescription for a potentially harmful medication, concurrent with or after the diagnosis. Three rates are reported for this measure:

- Rate 1: The percentage of those with a history of falls that received a potentially harmful medication
- Rate 2: The percentage of those with dementia that received a potentially harmful medication
- Rate 3: The percentage of those with chronic kidney disease that received a potentially harmful medication

A lower rate represents better performance for all rates.

0022: Use of High-Risk Medications in Older Adults (DAE)

The percentage of patients 65 years of age and older who received at least two dispensing events for the same high-risk medication. A lower rate represents better performance.

Type

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Process

0022: Use of High-Risk Medications in Older Adults (DAE)

Process

Data Source

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided Attachment 2993_DDE_Fall_2020_Value_Sets.xlsx

0022: Use of High-Risk Medications in Older Adults (DAE)

Claims This measure is based on administrative claims collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Management Organizations and Preferred Provider Organizations via NCQA's online data submission system.

No data collection instrument provided No data dictionary

Level

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Health Plan

0022: Use of High-Risk Medications in Older Adults (DAE)

Health Plan

Setting

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Outpatient Services

0022: Use of High-Risk Medications in Older Adults (DAE)

Outpatient Services

Numerator Statement

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Numerator 1: Patients with a history of falls who received at least one potentially harmful medication from Table DDE-A or Table DDE-B

Numerator 2: Patients with a diagnosis of dementia who received at least one potentially harmful medication from Table DDE-D

Numerator 3: Patients with chronic kidney disease who received at least one potentially harmful medication from Table DDE-E

0022: Use of High-Risk Medications in Older Adults (DAE)

Patients who received at least two dispensing events for the same high-risk medication during the measurement year.

Numerator Details

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Rate 1 numerator: Dispensed an ambulatory prescription for an anticonvulsant, SSRI, or SNRI (Table DDE-A), or antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B) on or between the index episode start date (IESD) and December 31 of the measurement year.

Rate 2 numerator: Dispensed an ambulatory prescription for an antipsychotic, benzodiazepine, nonbenzodiazepine hypnotic or tricyclic antidepressant (Table DDE-B), or anticholinergic agent (Table DDE-D) on or between the IESD and December 31 of the measurement year.

Rate 3 numerator: Dispensed an ambulatory prescription for a Cox-2 selective NSAID or nonaspirin NSAID (Table DDE-E) on or between the IESD and December 31 of the measurement year.

Note: Do not include denied claims.

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

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Table DDE-A: Potentially Harmful Drugs – Rate 1

Anticonvulsants:

Carbamazepine, Clobazam, Divalproex sodium, Ethosuximide, Ethotoin, Ezogabine, Felbamate, Fosphenytoin, Gabapentin, Lacosamide, Lamotrigine, Levetiracetam, Methsuximide, Oxcarbazepine, Phenobarbital, Phenytoin, Pregabalin, Primidone, Rufinamide, Tiagabine HCL, Topiramate, Valproate sodium, Valproic acid, Vigabatrin, Zonisamide

SNRIs:

Desvenlafaxine, Duloxetine, Levomilnacipran, Venlafaxine

SSRIs:

Citalopram, Escitalopram, Fluoxetine, Fluvoxamine, Paroxetine, Setraline

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Table DDE-B: Potentially Harmful Drugs – Rate 1 (History of Falls) and Rate 2 (Dementia)

Antipsychotics:

Aripiprazole, Asenapine, Brexpiprazole, Cariprazine, Chlorpromazine, Clozapine, Fluphenazine, Haloperidol, Iloperidone, Loxapine, Lurasidone, Molindone, Olanzapine, Paliperidone, Perphenazine, Pimozide, Quetiapine, Risperidone, Thioridazine, Thiothixene, Trifluoperazine, Ziprasidone

Benzodiazepine hypnotics:

Alprazolam, Chlordiazepoxide products, Clonazepam, Clorazepate-Dipotassium, Diazepam, Estazolam, Flurazepam HCL, Lorazepam, Midazolam HCL, Oxazepam, Quazepam, Temazepam, Triazolam

Nonbenzodiazepine hypnotics:

Eszopiclone, Zaleplon, Zolpidem

Tricyclic antidepressants:

Amitriptyline, Amoxapine, Clomipramine, Desipramine, Doxepin (>6 mg), Imipramine, Nortriptyline, Protriptyline, Trimipramine

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Table DDE-D: Potentially Harmful Drugs – Rate 2 (Dementia)

Anticholinergic agents, antiemetics:

Prochlorperazine, Promethazine

Anticholinergic agents, antihistamines:

Brompheniramine, Carbinoxamine, Chlorpheniramine, Hydroxyzine, Clemastine, Cyproheptadine, Pyrilamine, Triprolidine, Dimenhydrinate, Diphenhydramine, Meclizine, Dexbrompheniramine, Dexchlorpheniramine, Doxylamine

Anticholinergic agents, antispasmodic:

Atropine, Homatropine, Belladonna alkaloids, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine, Clidinium-chlordiazepoxide

Anticholinergic agents, antimuscarinics (oral)

Darifenacin, Fesoterodine, Solifenacin, Trospium, Flavoxate, Oxybutynin, Tolterodine

Anticholinergic agents, anti-Parkinson agents

Benztropine, Trihexyphernidyl

Anticholinergic agents, skeletal muscle relaxants

Cyclobenzaprine, Orphenadrine

Anticholinergic agents, SSRIs:

Paroxetine

Anticholinergic agents, antiarrhythmic:

Disopyramide

Table DDE-E: Cox-2 Selective NSAIDs and Nonasprin NSAIDs

Cox-2 Selective NSAIDs:

Celecoxib

Nonaspirin NSAIDs:

Diclofenac potassium, Diclofenac sodium, Etodolac, Fenoprofen, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Ketorolac, Meclofenamate, Mefenamic acid, Meloxicam, Nabumetone, Naproxen, Naproxen sodium, Oxaprozin, Piroxicam, Sulindac, Tolmetin

0022: Use of High-Risk Medications in Older Adults (DAE)

Patients who had at least two dispensing events for the same high-risk medication during the measurement year.

Follow the steps below to identify numerator compliance. Include patients who meet criteria in more than one step only once in the numerator. Do not include denied claims.

Step 1: Identify patients with two or more dispensing events (any days supply) on different dates of service during the measurement year for a medication in Table DAE-A. The dispensing events must be for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant.

Step 2: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-B. Identify patients with two or more dispensing events on different dates of service for medications in the same medication class (as defined by the AGS Beers Criteria Table 2 and class title below). For example, a prescription for zolpidem and a prescription for zaleplon are considered two dispensing events for medications in the same medication class (these drugs share the same class title or description: Nonbenzodiazepine hypnotics). Sum the days supply for prescriptions in the same medication class. Identify patients with two or more dispensing events for medications of the same medication class where the summed days supply exceeds the days supply criteria listed for the medication. These patients are numerator compliant. For medications dispensed during the measurement year sum the days supply and include any days supply that extends beyond December 31 of the measurement year. For example, a prescription of a 90-days supply dispensed on December 1 of the measurement year counts as a 90-days supply.

- Note: The intent is to identify all patients who had multiple dispensing events where the summed days supply exceeds the days supply criteria; there is no requirement that each dispensing event exceed the days supply criteria.

Step 3: For each patient, identify all dispensing events during the measurement year for medications in Table DAE-C where average daily dose exceeds the average daily dose criteria listed for the medication. Identify patients with two or more dispensing events on different dates of service that exceed the average daily dose criteria for the same drug as identified by the Drug ID in the NDC list. These patients are numerator compliant. To calculate average daily dose for each dispensing event, multiply the quantity of pills dispensed by the dose of each pill and divide by the days supply. For example, a prescription for a 30-days supply of digoxin containing 15 pills, .250 mg each pill, has an average daily dose of 0.125 mg. To calculate average daily dose for elixirs and concentrates, multiply the volume dispensed by daily dose and divide by the days supply. Do not round when calculating average daily dose.

HIGH-RISK MEDICATIONS (Table DAE-A)

Anticholinergics, First-generation antihistamines---

Brompheniramine, Carbinoxamine, Chlorpheniramine, Clemastine, Cyproheptadine, Dexbrompheniramine, Dexchlorpheniramine, Diphenhydramine (oral), Dimenhydrinate, Doxylamine, Hydroxyzine, Meclizine, Promethazine, Pyrilamine, Triprolidine

Anticholinergics, anti-Parkinson agents---

Benztropine (oral), Trihexyphenidyl

Antispasmodics---

Atropine (exclude ophthalmic), Bellandonna alkaloids, Clidinium-Chlordiazepoxide, Dicyclomine, Hyoscyamine, Methscopolamine, Propantheline, Scopolamine

Antithrombotics---
Dipyridamole, oral short-acting (does not apply to the extended-release combination with aspirin)
Cardiovascular, alpha agonists, central---
Guanabenz, Guanfacine, Methyldopa
Cardiovascular, other---
Disopyramide, Nifedipine (immediate release)
Central nervous system, antidepressants---
Amitriptyline, Clomipramine, Imipramine, Trimipramine, Amoxapine, Desipramine, Nortiptyline, Paroxetine, Protriptyline
Central nervous system, barbiturates---
Amobarbital, Butabarbital, Butalbital, Mephobarbital, Pentobarbital, Phenobarbital, Secobarbital
Central nervous system, vasodilators---
Ergot mesylates, Isoxsuprine
Central nervous system, other---
Meprobamate
Endocrine system, estrogens with or without progestins; include only oral and topical patch products---
Conjugated estrogen, Esterified estrogen, Estradiol, Estropipate
Endocrine system, sulfonylureas, long-duration---
Chlorpropamide, Glimepiride, Glyburide
Endocrine system, other---
Desiccated thyroid, Megestrol
Pain medications, skeletal muscle relaxants---
Carisoprodol, Chlorzoxazone, Cyclobenzaprine, Metaxalone, Methocarbamol, Orphenadrine
Pain medications, other---
Indomethacin, Ketorolac (includes parenteral), Meperidine

HIGH-RISK MEDICATIONS WITH DAYS SUPPLY CRITERIA (Table DAE-B)
Anti-infectives, other (greater than 90 days supply, days supply criteria)---
Nitrofurantoin, Nitrofurantoin macrocrystals, Nitrofurantoin macrocrystals-monohydrate
Nonbenzodiazepine hypnotics (greater than 90 days supply, days supply criteria)---
Eszopiclone, Zolpidem, Zaleplon

HIGH-RISK MEDICATIONS WITH AVERAGE DAILY DOSE CRITERIA (Table DAE-C)

Alpha agonists, central (greater than 0.1 mg/day, average daily dose criteria)---

Reserpine

Cardiovascular, other (greater than 0.125 mg/day, average daily dose criteria)---

Digoxin

Tertiary TCAs (as single agent or as part of combination products), (greater than 6 mg/day, average daily dose criteria)---

Doxepin

Note: NCQA will post a comprehensive list of medications and NDC codes to www.ncqa.org by November 2020. For medications in Table DAE-A and DAE-C, identify different drugs using the Drug ID field located in the NDC list on NCQA's Web site (www.ncqa.org), posted by November 2020.

Denominator Statement

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

All patients 65 years of age and older with a history of falls, dementia or chronic kidney disease in the measurement year or the year prior to the measurement year.

0022: Use of High-Risk Medications in Older Adults (DAE)

All patients 65 years of age and older.

Denominator Details

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

All patients ages 67 years and older as of December 31 of the measurement year with a history of falls, dementia or chronic kidney disease. Each of the three rates in the measure has a different denominator:

Rate 1 denominator: Patients with an accidental fall or hip fracture (Note: hip fractures are used as a proxy for identifying accidental falls). Individuals with either of the following on or between January 1 of the year prior to the measurement year and December 1 of the measurement year meet criteria:

- An accidental fall (Falls Value Set).
- An acute inpatient encounter (Acute Inpatient Value Set), nonacute inpatient encounter (Nonacute Inpatient Value Set), outpatient visit (Outpatient Value Set), an observation visit (Observation Value Set) or an ED visit (ED Value Set) with a hip fracture (Hip Fractures Value Set).

- An acute or nonacute inpatient discharge with a hip fracture (Hip Fractures Value Set). To identify acute and nonacute inpatient discharges:

1) Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2) Identify the discharge date for the stay.
3) Identify the index episode start date (IESD) for each patient.

Rate 2 denominator: Patients with a diagnosis of dementia (Dementia Value Set) or a dispensed dementia medication (Table DDE-C) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient.

Rate 3 denominator: Patients with chronic kidney disease as identified by a diagnosis of ESRD (ESRD Value Set), dialysis (Dialysis Procedure Value Set), stage 4 chronic kidney disease (CKD Stage 4 Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

Note: Patients with more than one disease or condition may appear in the measure multiple times (i.e., in each indicator for which they qualify).

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

See S.2.b for all Value Sets

Table DDE-C: Prescriptions to Identify Members with Dementia

Cholinesterase inhibitors:

Donepezil, Galantamine, Rivastigmine

Miscellaneous central nervous system agents:

Memantine

0022: Use of High-Risk Medications in Older Adults (DAE)

All patients that are 66 years of age and older as of December 31 of the measurement year.

Exclusions

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

For those who meet denominator criteria for the history of falls rate (Rate 1): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder or seizure disorder.

For those who meet denominator criteria for the dementia rate (Rate 2): exclude those with a diagnosis of psychosis, schizophrenia, schizoaffective disorder or bipolar disorder.

0022: Use of High-Risk Medications in Older Adults (DAE)

Patients who were enrolled in hospice care at any time during the measurement year.

Exclusion Details

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

For those who meet denominator criteria for the history of falls rate (Rate 1): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set), bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set), major depressive disorder (Major Depression or Dysthymia Value Set) or seizure disorder (Seizure Disorders Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For those who meet denominator criteria for the dementia rate (Rate 2): Exclude patients with a diagnosis of psychosis (Psychosis Value Set), schizophrenia, schizoaffective disorder (Schizophrenia Value Set) or bipolar disorder (Bipolar Disorder Value Set; Other Bipolar Disorder Value Set) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year.

0022: Use of High-Risk Medications in Older Adults (DAE)

N/A

Risk Adjustment

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

No risk adjustment or risk stratification

0022: Use of High-Risk Medications in Older Adults (DAE)

No risk adjustment or risk stratification

Stratification

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

No risk adjustment or risk stratification

0022: Use of High-Risk Medications in Older Adults (DAE)

N/A

Type Score

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Rate/proportion better quality = lower score

0022: Use of High-Risk Medications in Older Adults (DAE)

Rate/proportion better quality = lower score

Algorithm

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

Step 1. Determine the eligible population: All patients 67 years of age and older as of the end (i.e., December 31) of the measurement year.

Step 2: Identify the denominators for each of the three rates:

Rate 1: Those in the eligible population with a history of falls (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, bipolar disorder, major depressive disorder, or seizure disorder (see S.9 for details). Identify the index episode start date (IESD) for each patient.

Rate 2: Those in the eligible population with dementia (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Exclude patients with a diagnosis of psychosis, schizophrenia, or bipolar disorder (see S.9 for details). Identify the IESD for each patient.

Rate 3: Those in the eligible population with chronic kidney disease (see S.7 for details) on or between January 1 of the year prior to the measurement year and December 1 of the measurement year. Identify the IESD for each patient.

Step 3: Identify the numerators: Individuals in each of the denominators who have received at least one potentially harmful medication on or after the IESD (see definitions of potentially harmful medications for each numerator in section S.5).

Step 4: Calculate the rates:

Rate 1 – Numerator 1 divided by denominator 1.

Rate 2 – Numerator 2 divided by denominator 2.

Rate 3 – Numerator 3 divided by denominator 3.

Note: For this measure, a lower rate indicates better performance for all three rates.

Index Episode Start Date. The earliest diagnosis, procedure or prescription between January 1 of the year prior to the measurement year and December 1 of the measurement year.

For an outpatient claim/encounter, the IESD is the date of service.

For an inpatient claim/encounter, the IESD is the discharge date.

For an acute inpatient encounter identified only by a professional claim (where the discharge date cannot be determined), the IESD is the date of service.

For dispensed prescriptions, the IESD is the dispense date.

0022: Use of High-Risk Medications in Older Adults (DAE)

Step 1. Determine the denominator: All patients 66 years of age and older as of the end (i.e., December 31) of the measurement year.

Step 2: Identify the numerator: Individuals in the denominator who have dispensed at least two prescriptions for the same high-risk medication (see definition of high-risk medication in section S.6) during the measurement year.

Step 3: Divide Step 2 (numerator) by Step 1 (denominator) to calculate the rate.

Note: For this measure, a lower rate indicates better performance.

Submission items

2993: Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The Use of High-Risk Medications in Older Adults (DAE) measure and NQF 2993 have a similar focus (measuring potentially inappropriate medication use in older adults) and reporting level (health plan), however they have different target populations. The DAE measure targets a larger population of all older adults and assesses use of high-risk medications that have been recommended to be avoided in all older adults. This measure (NQF 2993) targets patients with a specific condition or disease who can experience adverse effects when combined with certain medications that are recommended to be avoided for that condition. The DAE measure (NQF 0022) is being submitted for NQF re-endorsement during this current Patient Safety project as well. Together these measures cover a significant portion of the AGS Beers Criteria recommendations for population-level medication safety assessment.

5b.1 If competing, why superior or rationale for additive value: N/A

0022: Use of High-Risk Medications in Older Adults (DAE)

5.1 Identified measures: 2993 : Potentially Harmful Drug-Disease Interactions in Older Adults (DDE)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The Potentially Harmful Drug-Disease Interactions in Older Adults (DDE) measure and NQF 0022 have a similar focus (measuring potentially inappropriate medication use in older adults) and reporting level (health plan), however they have different target populations. The DDE measure targets patients with a

specific condition or disease that can experience adverse effects when combined with certain medications that are recommended to be avoided for that condition. This measure (NQF 0022) targets a larger population of all older adults and assesses use of high-risk medications that have been recommended to be avoided in all older adults. The DDE measure (NQF 2993) is being submitted for NQF re-endorsement during this current Patient Safety project as well. Together these measures cover a significant portion of the AGS Beers Criteria recommendations for population-level medication safety assessment. This measure (NQF 0022) is harmonized with PQA's Use of High-Risk Medications in the Elderly (HRM) measure. The HRM measure is also based on the AGS Beers Criteria Table 2 and targets the same population of older adults. However, CMS will retire this display measure for 2021 and no longer reports this measure in the Patient Safety reports for the 2019 measurement year. Commenters supported retiring this measure.

5b.1 If competing, why superior or rationale for additive value: N/A

Appendix F: Pre-Evaluation Comments

Comments received as of January 15, 2021.

Topic	Commenter	Comment
NQF 1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	Submitted by Ms. Koryn Y. Rubin, MHA	The American Medical Association (AMA) appreciates the opportunity to comment on #468, Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization. We are disappointed to see the minimum measure score reliability results of 0.32 using a minimum case number of 25 patients and the intraclass correlation coefficients (ICC) was 0.477. We believe that measures must meet minimum acceptable thresholds of 0.7 for reliability and require higher case minimums to allow the overwhelming majority of hospitals to achieve an ICC of 0.6 or higher. In addition, the AMA is extremely concerned to see that the measure developer used the recommendation to not include social risk factors in the risk adjustment models for measures that are publicly reported as outlined in the recent report to Congress by Assistant Secretary for Planning and Evaluation (ASPE) on Social Risk Factors and Performance in Medicare's Value-based Purchasing program (ASPE, 2020). We believe that while the current testing may not have produced results that would indicate incorporation of the two social risk factors included in testing, this measure is currently used both for public reporting and value-based purchasing. A primary limitation of the ASPE report was that none of the recommendations adequately addressed whether it was or was not appropriate to adjust for social risk factors in the same measure used for more than one accountability purpose, which is the case for here. This discrepancy along with the fact that the additional analysis using the American Community Survey is not yet released must be addressed prior to any measure developer relying on the recommendations within this report. We request that the Standing Committee evaluate whether the measure meets the scientific acceptability criteria. Reference: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services.

Topic	Commenter	Comment
		Second Report to Congress on Social Risk Factors and Performance in Medicare's Value-Based Purchasing Program. 2020. https://aspe.hhs.gov/social-risk-factors-and-medicares-value-based-purchasing-programs
NQF 0531: Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite	Submitted by Ms. Koryn Y. Rubin, MHA	The American Medical Association (AMA) appreciates the opportunity to comment on #531, Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite. We are disappointed to see that only 67% of all hospitals were able to achieve an intraclass correlation coefficients (ICC) of =>0.6 in the split sample testing and only 51% in the test-retest using 24 months of data. We believe that measures must require higher case minimums to allow the overwhelming majority of hospitals to achieve an ICC of 0.6 or higher. In addition, the AMA is extremely concerned to see that the measure developer used the recommendation to not include social risk factors in the risk adjustment models for measures that are publicly reported as outlined in the recent report to Congress by Assistant Secretary for Planning and Evaluation (ASPE) on Social Risk Factors and Performance in Medicare's Value-based Purchasing program (ASPE, 2020). We believe that while the current testing may not have produced results that would indicate incorporation of the two social risk factors included in testing, this measure is currently used both for public reporting and value-based purchasing. A primary limitation of the ASPE report was that none of the recommendations adequately addressed whether it was or was not appropriate to adjust for social risk factors in the same measure used for more than one accountability purpose, which is the case for here. This discrepancy along with the fact that the additional analysis using the American Community Survey is not yet released must be addressed prior to any measure developer relying on the recommendations within this report. We request that the Standing Committee evaluate whether the measure meets the scientific acceptability criteria. Reference: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services. Second Report to Congress on Social Risk Factors and Performance in Medicare's Value-Based Purchasing

Topic	Commenter	Comment
		Program. 2020. https://aspe.hhs.gov/social-risk-factors-and-medicares-value-based-purchasing-programs
NQF 0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	Submitted by Ms. Koryn Y. Rubin, MHA	The American Medical Association (AMA) appreciates the opportunity to comment on #468, Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization. We are disappointed to see the minimum measure score reliability results of 0.31 using a minimum case number of 25 patients. We believe that measures must meet minimum acceptable thresholds of 0.7 for reliability. In addition, the AMA is extremely concerned to see that the measure developer used the recommendation to not include social risk factors in the risk adjustment models for measures that are publicly reported as outlined in the recent report to Congress by Assistant Secretary for Planning and Evaluation (ASPE) on Social Risk Factors and Performance in Medicare's Value-based Purchasing program (ASPE, 2020). We believe that while the current testing may not have produced results that would indicate incorporation of the two social risk factors included in testing, this measure is currently used both for public reporting and value-based purchasing. A primary limitation of the ASPE report was that none of the recommendations adequately addressed whether it was or was not appropriate to adjust for social risk factors in the same measure used for more than one accountability purpose, which is the case for here. This discrepancy along with the fact that the additional analysis using the American Community Survey is not yet released must be addressed prior to any measure developer relying on the recommendations within this report. We request that the Standing Committee evaluate whether the measure meets the scientific acceptability criteria. Reference: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services. Second Report to Congress on Social Risk Factors and Performance in Medicare's Value-Based Purchasing Program. 2020. https://aspe.hhs.gov/social-risk-factors-and-medicares-value-based-purchasing-programs

Topic	Commenter	Comment
NQF 0468: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	Submitted by Dr. Claudia A. Salzberg, PhD	The Federation of American Hospitals (FAH) appreciates the opportunity to comment on Measure #468, Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization. The FAH is concerned that even though the median reliability score was 0.78 for hospitals with at least 25 cases, reliability ranged from 0.31 to 0.98 and believes that the developer must increase the minimum sample size to a higher number to produce a minimum reliability threshold of sufficient magnitude (e.g. 0.7 or higher). In addition, the FAH is very concerned to see that the measure developer's rationale to not include social risk factors in the risk adjustment model was in part based on the recommendations from the report to Congress by Assistant Secretary for Planning and Evaluation (ASPE) on Social Risk Factors and Performance in Medicare's Value-based Purchasing program released in March of last year (ASPE, 2020). A fundament flaw within the ASPE report was the lack of any recommendation addressing how a single measure with multiple accountability uses should address inclusion of social risk factors as is the case with this measure, which is both publicly reported and included in the Hospital Value-Based Purchasing program. Regardless of whether the testing of social risk factors produced results that were sufficiently significant, the FAH believes that no developer should rely on the recommendations of this report until the question of how to handle multiple uses is addressed along with the additional analysis using the American Community Survey. As a result, the FAH requests that the Standing Committee carefully consider whether the measure as specified meets the scientific acceptability criteria. Reference: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services. Second Report to Congress on Social Risk Factors and Performance in Medicare's Value-Based Purchasing

Topic	Commenter	Comment
		Program. 2020. https://aspe.hhs.gov/social-risk-factors-and-medicares-value-based-purchasing-programs
NQF 0531: Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite	Submitted by Dr. Claudia A. Salzberg, PhD	The Federation of American Hospitals (FAH) appreciates the opportunity to comment on Measure #531, Patient Safety Indicator (PSI) 90: Patient Safety and Adverse Events Composite. FAH is concerned that the majority of hospitals (67% in the split sample and 51% in the test-retest) were unable to achieve an intraclass correlation coefficients (ICC) of equal to or greater than 0.6. We believe that the developer must increase the minimum sample size to a higher number to ensure that at least 90% of the hospitals achieve an ICC of 0.6 or higher. In addition, the FAH is very concerned to see that the measure developer's rationale to not include social risk factors in the risk adjustment model was in part based on the recommendations from the report to Congress by Assistant Secretary for Planning and Evaluation (ASPE) on Social Risk Factors and Performance in Medicare's Value-based Purchasing program released in March of last year (ASPE, 2020). A fundament flaw within the ASPE report was the lack of any recommendation addressing how a single measure with multiple accountability uses should address inclusion of social risk factors as is the case with this measure, which is both publicly reported and included in the Hospital Value-Based Purchasing program. Regardless of whether the testing of social risk factors produced results that were sufficiently significant, the FAH believes that no developer should rely on the recommendations of this report until the question of how to handle multiple uses is addressed along with the additional analysis using the American Community Survey. As a result, the FAH requests that the Standing Committee carefully consider whether the measure as specified meets the scientific acceptability criteria. Reference: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services.

Topic	Commenter	Comment
		Second Report to Congress on Social Risk Factors and Performance in Medicare's Value-Based Purchasing Program. 2020. https://aspe.hhs.gov/social-risk-factors-and-medicares-value-based-purchasing-programs
NQF 1893: Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	Submitted by Dr. Claudia A. Salzberg, PhD	The Federation of American Hospitals (FAH) appreciates the opportunity to comment on Measure #468, Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization. The FAH is concerned that even though the median reliability score was 0.72 for hospitals with at least 25 cases, reliability ranged from 0.32 to 0.97 and that the intraclass correlation coefficients (ICC) was 0.477. The FAH believes that the developer must increase the minimum sample size to a higher number to produce a minimum reliability threshold of sufficient magnitude (e.g. 0.7 or higher) and an ICC of 0.6 or higher. In addition, the FAH is very concerned to see that the measure developer's rationale to not include social risk factors in the risk adjustment model was in part based on the recommendations from the report to Congress by Assistant Secretary for Planning and Evaluation (ASPE) on Social Risk Factors and Performance in Medicare's Value-based Purchasing program released in March of last year (ASPE, 2020). A fundament flaw within the ASPE report was the lack of any recommendation addressing how a single measure with multiple accountability uses should address inclusion of social risk factors as is the case with this measure, which is both publicly reported and included in the Hospital Value-Based Purchasing program. Regardless of whether the testing of social risk factors produced results that were sufficiently significant, the FAH believes that no developer should rely on the recommendations of this report until the question of how to handle multiple uses is addressed along with the additional analysis using the American Community Survey. As a result, the FAH requests that the Standing Committee carefully consider whether the measure as specified meets the scientific acceptability criteria.

Topic	Commenter	Comment
		Reference: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services. Second Report to Congress on Social Risk Factors and Performance in Medicare's Value-Based Purchasing Program. 2020. https://aspe.hhs.gov/social-risk-factors-and-medicares-value-based-purchasing-programs

National Quality Forum
1099 14th Street NW, Suite 500
Washington, DC 20005
http://www.qualityforum.org