**National Quality Forum—Measure Testing (subcriteria 2a2, 2b1-2b6)**

**Measure Number** (*if previously endorsed*)**:** 1454

**Measure Title**: Proportion of patients with hypercalcemia

**Date of Submission**: 1/7/2019

**Type of Measure:**

|  |  |
| --- | --- |
| Outcome (*including PRO-PM*) | Composite – ***STOP – use composite testing form*** |
| Intermediate Clinical Outcome | Cost/resource |
| Process *(including Appropriate Use)* | Efficiency |
| Structure |  |

|  |
| --- |
| **Instructions**   * Measures must be tested for all the data sources and levels of analyses that are specified. ***If there is more than one set of data specifications or more than one level of analysis, contact NQF staff*** about how to present all the testing information in one form. * **For all measures, sections 1, 2a2, 2b1, 2b2, and 2b4 must be completed.** * **For outcome and resource use measures**, section **2b3** also must be completed. * If specified for **multiple data sources/sets of specificaitons** (e.g., claims and EHRs), section **2b5** also must be completed. * Respond to all questions as instructed with answers immediately following the question. All information on testing to demonstrate meeting the subcriteria for reliability (2a2) and validity (2b1-2b6) must be in this form. An appendix for *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 25 pages (*incuding questions/instructions;* minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). * For information on the most updated guidance on how to address social risk factors variables and testing in this form refer to the release notes for version 7.1 of the Measure Testing Attachment. |

|  |
| --- |
| **Note:** The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the testing results for this measure meet NQF’s evaluation criteria for testing.  **2a2.** **Reliability testing** [**10**](#Note10) demonstrates the measure data elements are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period and/or that the measure score is precise. For **instrument-based measures** (including PRO-PMs) **and composite performance measures**, reliability should be demonstrated for the computed performance score.  **2b1.** **Validity testing** [**11**](#Note11) demonstrates that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality. For **instrument-based measures (including PRO-PMs) and composite performance measures**, validity should be demonstrated for the computed performance score.    **2b2.** **Exclusions** are supported by the clinical evidence and are of sufficient frequency to warrant inclusion in the specifications of the measure; [**12**](#Note12)  **AND**  If patient preference (e.g., informed decisionmaking) is a basis for exclusion, there must be evidence that the exclusion impacts performance on the measure; in such cases, the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately). [**13**](#Note13)  **2b3.** **For outcome measures and other measures when indicated** (e.g., resource use):   * **an evidence-based risk-adjustment strategy** (e.g., risk models, risk stratification) is specified; is based on patient factors (including clinical and social risk factors) that influence the measured outcome and are present at start of care; [**14**](#Note14)**,**[**15**](#Note15) and has demonstrated adequate discrimination and calibration   **OR**   * rationale/data support no risk adjustment/ stratification.   **2b4.** Data analysis of computed measure scores demonstrates that methods for scoring and analysis of the specified measure allow for **identification of statistically significant and practically/clinically meaningful** [**16**](#Note16) **differences in performance**;  **OR**  there is evidence of overall less-than-optimal performance.  **2b5.** **If multiple data sources/methods are specified, there is demonstration they produce comparable results**.  **2b6.** Analyses identify the extent and distribution of **missing data** (or nonresponse) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and nonresponders) and how the specified handling of missing data minimizes bias.  **Notes**  **10.** Reliability testing applies to both the data elements and computed measure score. Examples of reliability testing for data elements include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing of the measure score addresses precision of measurement (e.g., signal-to-noise).  **11.** Validity testing applies to both the data elements and computed measure score. Validity testing of data elements typically analyzes agreement with another authoritative source of the same information. Examples of validity testing of the measure score include, but are not limited to: testing hypotheses that the measures scores indicate quality of care, e.g., measure scores are different for groups known to have differences in quality assessed by another valid quality measure or method; correlation of measure scores with another valid indicator of quality for the specific topic; or relationship to conceptually related measures (e.g., scores on process measures to scores on outcome measures). Face validity of the measure score as a quality indicator may be adequate if accomplished through a systematic and transparent process, by identified experts, and explicitly addresses whether performance scores resulting from the measure as specified can be used to distinguish good from poor quality. The degree of consensus and any areas of disagreement must be provided/discussed.  **12.** Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, variability of exclusions across providers, and sensitivity analyses with and without the exclusion.  **13.** Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.  **14.** Risk factors that influence outcomes should not be specified as exclusions.  **15.** With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74 percent v. 75 percent) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v. $5,025) is practically meaningful. Measures with overall less-than-optimal performance may not demonstrate much variability across providers. |

**1. DATA/SAMPLE USED FOR ALL TESTING OF THIS MEASURE**

*Often the same data are used for all aspects of measure testing. In an effort to eliminate duplication, the first five questions apply to all measure testing. If there are differences by aspect of testing,(e.g., reliability vs. validity) be sure to indicate the specific differences in question 1.7.*

**1.1. What type of data was used for testing**? (*Check all the sources of data identified in the measure specifications and data used for testing the measure*. *Testing must be provided for all the sources of data specified and intended for measure implementation.* ***If different data sources are used for the numerator and denominator, indicate N [numerator] or D [denominator] after the checkbox.***)

|  |  |
| --- | --- |
| **Measure Specified to Use Data From:**  **(*must be consistent with data sources entered in S.17*)** | **Measure Tested with Data From:** |
| abstracted from paper record | abstracted from paper record |
| claims | claims |
| registry | registry |
| abstracted from electronic health record | abstracted from electronic health record |
| eMeasure (HQMF) implemented in EHRs | eMeasure (HQMF) implemented in EHRs |
| other: Click here to describe | other: Click here to describe |

**1.2. If an existing dataset was used, identify the specific dataset** (*the dataset used for testing must be consistent with the measure specifications for target population and healthcare entities being measured; e.g., Medicare Part A claims, Medicaid claims, other commercial insurance, nursing home MDS, home health OASIS, clinical registry*).

We analyzed national CROWNWeb data from January 201 – December 2013.

For the Spring 2019 Maintenance submission, we analyzed CROWNWeb data from January 2017 – December 2017.

**1.3. What are the dates of the data used in testing**? January – December 2013

For the Spring 2019 Maintenance submission, we used data from January – December 2017.

**1.4. What levels of analysis** **were tested**? (*testing must be provided for all the levels specified and intended for measure implementation, e.g., individual clinician, hospital, health plan*)

|  |  |
| --- | --- |
| **Measure Specified to Measure Performance of:**  **(*must be consistent with levels entered in item S.20*)** | **Measure Tested at Level of:** |
| individual clinician | individual clinician |
| group/practice | group/practice |
| hospital/facility/agency | hospital/facility/agency |
| health plan | health plan |
| other: Click here to describe | other: Click here to describe |

**1.5. How many and which measured entities were included in the testing and analysis (by level of analysis and data source)**? (*identify the number and descriptive characteristics of measured entities included in the analysis (e.g., size, location, type); if a sample was used, describe how entities were selected for inclusion in the sample*)

5,880 facilities that had at least 11 eligible adult patients during January 2013 – December 2013 were included in the analyses. Public reporting of this measure on DFC or in the ESRD QIP would be restricted to facilities with at least 11 eligible patients for the measure. We have applied this restriction to all the reliability and validity testing reported here.

For the Spring 2019 Maintenance submissions, 6,824 facilities that had at least 11 eligible adult patients during January 2017 – December 2017 were included in the analyses. Public reporting of this measure on DFC or in the ESRD QIP would be restricted to facilities with at least 11 eligible patients for the measure to comply with restrictions on reporting of potentially patient identifiable information related to small sample size. We have applied this restriction to all the reliability and validity testing reported here.

**1.6. How many and which patients were included in the testing and analysis (by level of analysis and data source)**? (*identify the number and descriptive characteristics of patients included in the analysis (e.g., age, sex, race, diagnosis); if a sample was used, describe how patients were selected for inclusion in the sample*)

There were a total of 482,979 eligible patients. Among those patients, the average age was 62 years, 56% of patients were male, 57% were white, 35% were black, 5% were Asian/Pacific Islander, 18% were Hispanic, and 45% had type II diabetes as the primary cause of ESRD.

A subset of 482,444 eligible patients who belonged to the facilities that had at least 11 eligible patients were included in the testing and analyses.

For the Spring 2019 Maintenance submission, a total of 592,121 eligible patients who belonged to the facilities that had at least 11 eligible patients were included in the testing and analyses. Among those patients, the average age was 63 years, 57% of patients were male, 59% were white, 33% were black, 6% were Asian/Pacific Islander, 18% were Hispanic, and 46% had type II diabetes as the primary cause of ESRD.

**1.7. If there are differences in the data or sample used for different aspects of testing (e.g., reliability, validity, exclusions, risk adjustment), identify how the data or sample are different for each aspect of testing reported below**.

N/A

**1.8** **What were the social risk factors that were available and analyzed**? For example, patient-reported data (e.g., income, education, language), proxy variables when social risk data are not collected from each patient (e.g. census tract), or patient community characteristics (e.g. percent vacant housing, crime rate) which do not have to be a proxy for patient-level data.

N/A

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2a2. RELIABILITY TESTING**

***Note****: If accuracy/correctness (validity) of data elements was empirically tested*, *separate reliability testing of data elements is not required – in 2a2.1 check critical data elements; in 2a2.2 enter “see section 2b2 for validity testing of data elements”; and skip 2a2.3 and 2a2.4.*

**2a2.1. What level of reliability testing was conducted**? (*may be one or both levels*)  
 **Critical data elements used in the measure** (*e.g., inter-abstractor reliability; data element reliability must address ALL critical data elements*)  
 **Performance measure score** (e.g., *signal-to-noise analysis*)  
  
**2a2.2. For each level checked above, describe the method of reliability testing and what it tests** (*describe the steps―do not just name a method; what type of error does it test; what statistical analysis was used*)

We used January 2013 – December 2013 CROWNWeb data to calculate facility level monthly and annual performance scores. 5,880 facilities that had at least 11 eligible patients were included in the testing. This included a total of 482,444 patients.

We assessed reliability by calculating facility-level Pearson correlation coefficients between the current performance month and the preceding month for reporting months during January 2013 – December 2013.

In addition, we calculated inter-unit reliability (IUR) for each reporting month and the overall 12 months. The monthly based measure was a simple average across individuals in the facility. The NQF-recommended approach for determining measure reliability is a one-way analysis of variance (ANOVA), in which the between and within facility variation in the measure is determined. The inter-unit reliability (IUR) measures the proportion of the measure variability that is attributable to the between-facility variance. The yearly based measure, however, is not a simple average and we instead estimate the IUR using a bootstrap approach, which uses a resampling scheme to estimate the within facility variation that cannot be directly estimated by ANOVA.

For the Spring 2019 Maintenance submission, we followed the methodology described above to reproduce the inter-unit reliability calculation and Pearson correlation coefficients.

We used January 2017 – December 2017 CROWNWeb data to calculate facility level monthly and annual performance scores. 6,824 facilities that had at least 11 eligible patients were included in the testing. This included a total of 592,121 patients.

We assessed reliability by calculating facility-level Pearson correlation coefficients between the current performance month and the preceding month for reporting months during January 2017 – December 2017.

**2a2.3. For each level of testing checked above, what were the statistical results from reliability testing**? (e*.g., percent agreement and kappa for the critical data elements; distribution of reliability statistics from a signal-to-noise analysis*)

The Pearson correlation coefficients of each pair of the current and the preceding month ranged from

0.78 to 0.84. All were statistically significant (p<0.0001), indicating this measure is reliable over

time.

The monthly IURs ranged from 0.61 to 0.66, which indicates that more than half of the variation in the

monthly based measure can be attributed to the between facility differences and less than half to within

facility variation. The annual IUR across the 12 reporting months was 0.86, which indicates that 86% of the variation in the yearly based measure can be attributed to the between facility variation.

For the Spring 2019 Maintenance submission, the Pearson correlation coefficients of each pair of the current and the preceding month ranged from 0.78 to 0.88. All were statistically significant (p<0.0001), indicating this measure is reliable over time.

The monthly IURs ranged from 0.86 to 0.90, which indicates that more than 80% of the variation in the monthly based measure can be attributed to the between facility differences and less than half to within facility variation. The annual IUR across the 12 reporting months was 0.87, which indicates that 87% of the variation in the yearly based measure can be attributed to the between facility variation.

**2a2.4 What is your interpretation of the results in terms of demonstrating reliability**? (i*.e., what do the results mean and what are the norms for the test conducted?*)

The IURs provide evidence of reliability in that most of the variation can be attributed to the between facility variation. The monthly and overall IURs suggest this measure is reliable. However, since the distribution of performance scores is skewed, the IUR value should be interpreted with some caution. The moderate to strong statistically significant results of the Pearson correlations indicates this measure is reliable over time.

For the Spring 2019 Maintenance submission, the interpretation of the IUR results is similar to the previous submission; the monthly and overall IURs suggest this measure is reliable. However, since the distribution of performance scores is skewed, the IUR value should be interpreted with some caution.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2b1. VALIDITY TESTING**

**2b1.1. What level of validity testing was conducted**? (*may be one or both levels*)  
 **Critical data elements** (*data element validity must address ALL critical data elements*)

**Performance measure score**

**Empirical validity testing** **Systematic assessment of face validity of performance measure score as an indicator** of quality or resource use (*i.e., is an accurate reflection of performance on quality or resource use and can distinguish good from poor performance*) **NOTE**: Empirical validity testing is expected at time of maintenance review; if not possible, justification is required.

**2b1.2. For each level of testing checked above, describe the method of validity testing and what it tests** (*describe the steps―do not just name a method; what was tested, e.g., accuracy of data elements compared to authoritative source, relationship to another measure as expected; what statistical analysis was used)*

We used January 2013 – December 2013 CROWNWeb data to calculate facility level monthly and annual performance scores. 5,880 facilities that had at least 11 eligible patients were included in the testing.

This included a total of 482,444 patients.

We assessed validity using Poisson regression models to identify the predictive strength of facility level performance scores for the measure, on mortality, using the 2017 SMR.

In 2010, the measure was unanimously ratified by the Clinical TEP as a valid measure.

For the Spring 2019 Maintenance submission, we used January 2017 – December 2017 CROWNWeb data to calculate facility level monthly and annual performance scores. 6,824 facilities that had at least 11 eligible patients were included in the testing. This included a total of 592,121 patients.

We assessed validity using Poisson regression models to identify the predictive strength of facility level performance scores for the measure, on mortality, using the 2017 SMR. We anticipate a positive correlation with the SMR, since hypercalcemia is a marker of poor overall health.

In 2010, the measure was unanimously ratified by the Clinical TEP as a valid measure. In addition, the measure was presented to another Clinical TEP in 2013, who reaffirmed their support of hypercalcemia as a quality measure.

**2b1.3. What were the statistical results from validity testing**? (*e.g., correlation; t-test*)

Poisson regression modeling was used to assess the predictive strength of facility level performance scores for hypercalcemia on mortality, using the 2013 NQF endorsed SMR. The results suggest the measure performance scores were predictive of mortality as measured by the SMR. For instance, the facility-level relative risk of mortality for a 10% increase in percent of patients with hypercalcemia, is 1.07 (p<0.0001).

For the Spring 2019 Maintenance submission, the results again suggest the measure performance scores were predictive of mortality as measured by the 2017 SMR. The facility-level relative risk of mortality for a 10% increase in percent of patients with hypercalcemia, is 1.08 (p<0.0001).

**2b1.4. What is your interpretation of the results in terms of demonstrating validity**? (i*.e., what do the results mean and what are the norms for the test conducted?*)

The results of the Poisson regression suggest that facilities with a higher percentage of patient-months with hypercalcemia experience a higher standardized mortality rate relative to facilities with a lower percentage of patients with hypercalcemia. The direction of the relationship is as expected.

For the Spring 2019 Maintenance submission, the results of the Poisson regression again suggests that facilities with a higher percentage of patient-months with hypercalcemia experience a higher standardized mortality rate relative to facilities with a lower percentage of patients with hypercalcemia. The direction of the relationship is as expected.

We also maintain the measure on the basis of face validity as determined by the 2010 and 2013 TEPs.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2b2. EXCLUSIONS ANALYSIS**

**NA**  **no exclusions — *skip to section*** [***2b3***](#section2b4)

**2b2.1. Describe the method of testing exclusions and what it tests** (*describe the steps―do not just name a method; what was tested, e.g., whether exclusions affect overall performance scores; what statistical analysis was used*)

N/A

**2b2.2. What were the statistical results from testing exclusions**? (*include overall number and percentage of individuals excluded, frequency distribution of exclusions across measured entities, and impact on performance measure scores*)

N/A

**2b2.3. What is your interpretation of the results in terms of demonstrating that exclusions are needed to prevent unfair distortion of performance results?** (*i.e., the value outweighs the burden of increased data collection and analysis.*  *Note:* ***If patient preference is an exclusion****, the measure must be specified so that the effect on the performance score is transparent, e.g., scores with and without exclusion*)

N/A

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2b3. RISK ADJUSTMENT/STRATIFICATION FOR OUTCOME OR RESOURCE USE MEASURES**  
***If not an intermediate or health outcome, or PRO-PM, or resource use measure, skip to section*** [***2b4***](#section2b5)***.***

**2b3.1. What method of controlling for differences in case mix is used?**

**No risk adjustment or stratification**

**Statistical risk model with** Click here to enter number of factors **risk factors**

**Stratification by** Click here to enter number of categories **risk categories**

**Other,** Click here to enter description

**2b3.1.1 If using a statistical risk model, provide detailed risk model specifications, including the risk model method, risk factors, coefficients, equations, codes with descriptors, and definitions.**

N/A

**2b3.2. If an outcome or resource use component measure is not risk adjusted or stratified, provide rationale and analyses to demonstrate that controlling for differences in patient characteristics (case mix) is not needed to achieve fair comparisons across measured entities**.   
Risk adjustment is not necessary for this measure. Disparities were examined at the facility level in section 1b.4, and no disparities were observed.

No risk adjustment or risk stratification is required for this measure. The body of evidence and data on disparities presented in the Importance section do not support the need for risk adjustment (see response to 1b.4 and 1b.5).

**2b3.3a. Describe the conceptual/clinical and statistical methods and criteria used to select patient factors (clinical factors or social risk factors) used in the statistical risk model or for stratification by risk** (*e.g., potential factors identified in the literature and/or expert panel; regression analysis; statistical significance of p<0.10; correlation of x or higher; patient factors should be present at the start of care*) **Also discuss any “ordering” of risk factor inclusion**; for example, are social risk factors added after all clinical factors?

N/A

**2b3.3b. How was the conceptual model of how social risk impacts this outcome developed? Please check all that apply:**

**Published literature**

**Internal data analysis**

**Other (please describe)**

**2b3.4a. What were the statistical results of the analyses used to select risk factors?**

N/A

**2b3.4b. Describe the analyses and interpretation resulting in the decision to select social risk factors** *(e.g. prevalence of the factor across measured entities, empirical association with the outcome, contribution of unique variation in the outcome, assessment of between-unit effects and within-unit effects.)* **Also describe the impact of adjusting for social risk (or not) on providers at high or low extremes of risk.**

N/A

**2b3.5. Describe the method of testing/analysis used to develop and validate the adequacy of the statistical model or stratification approach** (*describe the steps―do not just name a method; what statistical analysis was used*)

*Provide the statistical results from testing the approach to controlling for differences in patient characteristics (case mix) below*.  
***If stratified, skip to*** [***2b3.9***](#question2b49)

N/A

**2b3.6. Statistical Risk Model Discrimination Statistics** (*e.g., c-statistic, R-squared*)**:**

N/A

**2b3.7. Statistical Risk Model Calibration Statistics** (*e.g., Hosmer-Lemeshow statistic*):

N/A

**2b3.8. Statistical Risk Model Calibration – Risk decile plots or calibration curves**:

N/A

**2b3.9. Results of Risk Stratification Analysis**:

N/A

**2b3.10. What is your interpretation of the results in terms of demonstrating adequacy of controlling for differences in patient characteristics (case mix)?** (i*.e., what do the results mean and what are the norms for the test conducted*)

N/A

**2b3.11.** **Optional Additional Testing for Risk Adjustment** (*not required, but would provide additional support of adequacy of risk model, e.g., testing of risk model in another data set; sensitivity analysis for missing data; other methods that were assessed*)

N/A

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2b4. IDENTIFICATION OF STATISTICALLY SIGNIFICANT & MEANINGFUL DIFFERENCES IN PERFORMANCE**

**2b4.1. Describe the method for determining if statistically significant and clinically/practically meaningful differences in performance measure scores among the measured entities can be identified** (*describe the steps―do not just name a method; what statistical analysis was used? Do not just repeat the information provided related to performance gap in 1b)*

Differences in measure performance were evaluated separately for each facility using patient level analyses. The proportion of patients with three-month (current month and the two prior months) rolling average of serum or plasma calcium greater than 10.2 (hypercalcemia), calculated at the year-level, was compared between one facility and the overall national distribution, and repeated for each individual facility.

Note that the monthly based measure is a simple average of binary outcomes across individuals in the facility, for which the binary outcome equals to 0 (failure=hypercalcemia or if the value of calcium for the reporting month is missing). The differences in proportions can be compared using Fisher’s Exact tests or its normal approximation. The yearly based measure, however, is not a simple average of binary outcomes and we instead used a re-sampling based exact test, with re-sampling generated from the population distribution of the patient level outcomes. Due to non-symmetric structure of the measure distributions, a one-sided test with significance level 0.025 is used (corresponding to cutoff=0.05 in a two-sided test). To calculate the p-value, we assess the probability that the facility would experience a number of events (i.e., percentage with hypercalcemia) more extreme than that observed if the null hypothesis were true, the null hypothesis being that the facility's distribution of hypercalcemia will follow the overall national distribution.

For the Spring 2019 submission, we reproduced the significance analysis using data from January – December 2017. We have revised the description of the analysis to be clearer:

Testing was performed on the yearly based performance score. We used a re-sampling based exact test, with re-sampling generated from the population distribution of the patient level outcomes. Note that a one-sided test with significance level 0.025 is used (corresponding to cutoff=0.05 in a two-sided test) due to non-symmetric structure of the measure's distribution. To calculate the p-value, we compute the probability that the facility would experience a number of events (i.e., percentage with hypercalcemia) more extreme than that observed if the null hypothesis were true, with the null hypothesis being that the  facility's distribution of hypercalcemia will follow the overall national distribution.

**2b4.2. What were the statistical results from testing the ability to identify statistically significant and/or clinically/practically meaningful differences in performance measure scores across measured entities?** (e.g., *number and percentage of entities with scores that were statistically significantly different from mean or some benchmark, different from expected; how was meaningful difference defined*)

Proportion of facilities with significant p-values (significance level <0.025) is shown as follows:

Category Number of facilities Percent of facilities

As expected 5004 85.1%

Worse than expected 876 14.9%

For the Spring 2019 Maintenance submission, the results were as follows:

Proportion of facilities with significant p-values (significance level <0.025) is shown as follows:

Category Number of facilities Percent of facilities

As expected 6,329 92.7%

Worse than expected 495 7.3%

**2b4.3. What is your interpretation of the results in terms of demonstrating the ability to identify statistically significant and/or clinically/practically meaningful differences in performance across measured entities?** (i*.e., what do the results mean in terms of statistical and meaningful differences?*)

Using monthly hypercalcemia, calculated at the year-level, as the performance measure, 5004 (85%) facilities have achieved expected performance, and 876 facilities (15%) performed worse than expected.

In general, higher rates of hypercalcemia represent worse quality of care. This analysis demonstrates the ability to identify both practical and statistically significant differences in performance across facilities based on their proportion of hypercalcemia.

For the Spring 2019 Maintenance submission, using monthly hypercalcemia, calculated at the year-level, as the performance measure, 6,329 (93%) facilities have achieved expected performance, and 495 facilities (7%) performed worse than expected.

In general, higher rates of hypercalcemia represent worse quality of care. This analysis demonstrates the ability to identify both practical and statistically significant differences in performance across facilities based on their proportion of hypercalcemia.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2b5. COMPARABILITY OF PERFORMANCE SCORES WHEN MORE THAN ONE SET OF SPECIFICATIONS**

***If only one set of specifications, this section can be skipped.***

**Note***: This item is directed to measures that are risk-adjusted (with or without social risk factors)* ***OR*** *to measures with more than one set of specifications/instructions (e.g., one set of specifications for how to identify and compute the measure from medical record abstraction and a different set of specifications for claims or eMeasures). It does not apply to measures that use more than one source of data in one set of specifications/instructions (e.g., claims data to identify the denominator and medical record abstraction for the numerator).* ***Comparability is not required when comparing performance scores with and without social risk factors in the risk adjustment model. However, if comparability is not demonstrated for measures with more than one set of specifications/instructions, the different specifications (e.g., for medical records vs. claims) should be submitted as separate measures.***

**2b5.1. Describe the method of testing conducted to compare performance scores for the same entities across the different data sources/specifications** (*describe the steps―do not just name a method; what statistical analysis was used*)

N/A

**2b5.2. What were the statistical results from testing comparability of performance scores for the same entities when using different data sources/specifications?** (*e.g., correlation, rank order*)

N/A

**2b5.3. What is your interpretation of the results in terms of the differences in performance measure scores for the same entities across the different data sources/specifications?** (i*.e., what do the results mean and what are the norms for the test conducted*)

N/A

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2b6. MISSING DATA ANALYSIS AND MINIMIZING BIAS**

**2b6.1. Describe the method of testing conducted to identify the extent and distribution of missing data (or nonresponse) and demonstrate that performance results are not biased** due to systematic missing data (or differences between responders and nonresponders) and how the specified handling of missing data minimizes bias (*describe the steps―do not just name a method; what statistical analysis was used*)

Reporting months with missing values are not excluded from this measure. Missing months are used as a component of the measure numerator, so introduction of bias from exclusion of missing values is not a consideration for the measure as specified.

**2b6.2. What is the overall frequency of missing data, the distribution of missing data across providers, and the results from testing related to missing data?** (*e.g.,**results of sensitivity analysis of the effect of various rules for missing data/nonresponse; if no empirical sensitivity analysis, identify the approaches for handling missing data that were considered and pros and cons of each*)

N/A

**2b6.3. What is your interpretation of the results in terms of demonstrating that performance results are not biased** due to systematic missing data (or differences between responders and nonresponders) and how the specified handling of missing data minimizes bias**?** (i*.e., what do the results mean in terms of supporting the selected approach for missing data and what are the norms for the test conducted; if no empirical analysis, provide rationale for the selected approach for missing data*)

N/A