NATIONAL QUALITY FORUM

Meeting Summary

Cost and Resource Use Standing Committee Webinar: Discussion of Conceptual Relationships between SDS Variables and Payment Outcomes: May 21, 2015 (2-4pm ET)

Committee Attendees: Brent Asplin, MD, MPH (Co-Chair); Lisa Latts, MD, MSPH, MBA, FACP (Co-Chair); Cheryl Damberg, PhD, Jennifer Eames-Huff, MPH; Nancy Garrett, PhD; Carolyn Pare; Jack Needleman, PhD; Janis Orlowski, MD, MACP; Andrew Ryan, PhD; Joseph Stephansky, PhD; William Weintraub, MD, FACC; Herbert Wong, PhD; Dolores Yanagihara, MPH.

Yale/Core Development Team Attendees: Nancy Kim, MD; Susannah Bernheim, MD

NQF Staff Attendees: Ashlie Wilbon, Karen Johnson

Purpose

- Provide an overview of the process and plan for reviewing the (3) CMS/Yale cost measures for cardiovascular and pneumonia conditions under the new guidance for sociodemographic status (SDS) risk adjustment.
- Review and discuss the conceptual analysis of the selected SDS risk adjustment factors for the (3) cost measures.
- Determine whether further empirical analysis of the impact of SDS factors in the risk model is warranted for the measures.
- Discuss and provide guidance on next steps for empirical analysis (if warranted) of the impact of the SDS factors in the risk model.

Measures under Consideration

- #2431: Hospital-level, risk-standardized payment associated with a 30-day episode-of-care for Acute Myocardial Infarction (AMI) (CMS/Yale)
- #2436: Hospital-level, risk-standardized payment associated with a 30-day episode-of-care for Heart Failure (HF) (CMS/Yale)
- #2579: Hospital-level, risk-standardized payment associated with a 30-day episode of care pneumonia (CMS/Yale)

Background

The NQF Board of Directors Executive Committee ratified the CSAC's recommendation to endorse the aforementioned measures only with the following conditions:

- One-year look-back assessment of unintended consequences: NQF staff will work with the Cost and Resource Use Standing Committee and CMS to determine a plan for assessing potential unintended consequences of this measure in use. The evaluation of unintended consequences will be initiated in approximately one year and possible changes to the measures based on this data will be discussed at that time.

- Consideration for the SDS trial period: The Cost and Resource Use Standing Committee will consider whether the measure should be included in the NQF trial period for sociodemographic status (SDS) adjustment.

This focus of this webinar was on the second condition, which indicated these measures should be considered during the SDS trial period. Based on the committee's prior discussions on the potential influence of SDS factors on cost and utilization outcomes and on comparability among hospitals, it was determined that these measures should be considered under the SDS trial period guidance.

Reviewing the Cost Measures during the SDS Trial Period

In collaboration with the CMS/Yale measure development team, NQF agreed to divide the assessment of the impact of SDS variables on the risk model and performance scores for the cost measures into two stages (and webinars):

- **Stage 1/Webinar #1 (May 21, 2015, 2-4pm ET): Conceptual Analysis**
  - Review of conceptual analysis of selected variables
  - Determine whether further empirical analysis is warranted
  - Identify the variables to be pursued in empirical analysis
  - Provide input on the plan or approach to empirical analysis of the selected variables.
- **Stage 2/Webinar #2 (October 27, 2015, 3-5pm ET): Empirical Analysis**
  - Review empirical analysis of the impact of SDS risk factors in the risk model
  - Determine endorsement status:
    - Recommend [continued] endorsement of the measure.
    - Recommend to de-endorse the measure.

Overview of the Sociodemographic Status (SDS) Adjustment Trial Period

The trial period approved by the NQF Board of Directors is designated as a 2-year period of time during which SDS factors should be considered as potential factors in the risk-adjustment model if there is a conceptual reason for doing so. If there is a conceptual relationship between potential SDS risk factors and the outcome of interest, the developer should conduct empirical analyses to determine whether such factors improve the risk-adjustment model. Based on that analysis, measure developers may submit measures with SDS factors included in the risk model. The trial period begins January 2015.

Prior to this decision, NQF criteria and policy prohibited the inclusion of SDS factors in the risk adjustment approach and only allowed for the inclusion of a patient's clinical factors present at the start of care. Rather than including SDS factors related to the outcome in the risk-adjustment model, NQF guidance indicated that measure results should be stratified by these variables.

Conceptual Analyses Review

A conceptual relationship refers to a logical theory or rationale that explains the association between an SDS factor(s) and the outcome of interest. The conceptual basis may be informed by prior research and/or healthcare experience related to the outcome of interest, but does not

require a direct causal relationship (i.e., it could be a direct cause, an indirect cause, or serve as a surrogate for a cause for which data are lacking).

An assessment of a conceptual relationship between an SDS factor and an outcome of interest includes a consideration of whether the effect of the SDS is primarily mediated by the quality of care delivered (i.e., does the SDS factor lead to the delivery of inferior care processes, which in turn affect the outcome?).

The CMS/Yale Core development team submitted a memo and conceptual model diagram illustrating the potential relationships of various factors during the episode of care captured by the measures (i.e., hospital admission through 30 days post discharge). Based on this conceptual analysis, they identified three variables that have been identified in the literature to have a conceptual relationship to utilization and payment. They also identified the relevant data that are currently available to them for potential empirical testing.

Selected SDS factors with conceptual relationship to utilization and payment	**Variables and data source**
Educational Attainment	Educational attainment obtained from Census data linked to patient's 5-digit ZIP Code
Income	Income level obtained from Census data linked to patient's 5-digit ZIP Code Medicaid (Dual Eligibility) Status as a proxy for low income, obtained from Medicare enrollment data
Insurance coverage	Medicaid (Dual Eligibility) Status as a proxy, obtained from Medicare enrollment data
Race	Operationalized as black or white race, obtained from Medicare enrollment data

In their overview of the conceptual model, the Yale team noted the following regarding their considerations on the appropriateness of adjusting on these variables:

- The association of low socioeconomic status and hospital cost is uncertain and exerts itself at multiple points in episode of care. The impact of SDS may be intrinsic to the patient or extrinsic and it is unclear whether hospitals should be held responsible and whether these factors should be included in the adjustment.
- During hospitalization, the hospital has control of a patient's care and therefore any differences in care influenced by SDS should not be adjusted for. Once a patient is discharged, the hospital only has partial control over the patient's care and environmental, community, and patient factors play a larger role.
- The risk standardized payments captured by the measures are based on DRGs (which do not account for length of stay, translational services, or the cost of care coordination). The risk-standardized payments captured by the measures are only linked to procedures, complications of care and sometimes comorbidities.

Discussion of Conceptual Model

The Committee discussed the conceptual model as well as the literature review summary submitted by the developer. The Committee expressed concerns about some elements of the conceptual model and offered suggestions on how to make it and the literature review broader and more comprehensive.

- Some members expressed concern that the conceptual model seemed too medical-oriented and should be broadened to account for more public health variables. For example, the model does not address community, environmental, or patient factors (e.g., social supports, lack of money to buy medication, no refrigerator). It is these factors that influence behavior, may be out of an individual's control, and that are missing from the model; the influence of these types of factors is why SDS adjustment would be considered necessary. The use of "patient behavior" as a variable only acknowledges one facet of the patient-related factors and seems to blame the patient for potential poor outcomes without acknowledging the factors that influence the behaviors. The Committee also suggested that a lack of patient resources should be differentiated from lack of community resources. Because the episode of care for these measures extends 30 days post discharge, implicitly the post-discharge period is likely to be where these factors make the most difference.
- The conceptual model should reflect resources available for care within individual hospitals. While these should not be included in the risk-adjustment approach, because differential resources can impact quality of care, it should be noted in the conceptual model.
- The Committee sought clarification on how the influence of SDS pre-admission is currently or could be accounted for in the model. The developers clarified that their approach accounts for the lifetime of SDS impact on health in the clinical risk factors in the model, by accounting for clinical comorbidities present on admission. There are currently no SDS variables in the conceptual model for pre-admission. Some Committee members believed that clinical comorbidities are only one aspect of pre-admission factors on which to adjust, and that there may be some residual effect of SDS that is not captured that could be further adjusted.
- For the literature review, the Committee expressed some concern that the scope of the review seemed too narrowly focused on payment and the specific conditions (heart failure, pneumonia, AMI). Members suggested that the developers do a broader search of literature to include readmissions and impact of SDS on health that might have been more informative. The developers acknowledged this concern, and noted that they purposely narrowed the literature review to focus on these factors so as not to be inundated with articles.
- Some members strongly suggested that between and within hospital differences should be a lens through which this information should be analyzed. There is some literature that suggests low SES patients receive the care within a low quality hospital or that low SES patients are more likely to get care in lower performing hospitals compared to higher quality hospitals. This represents actual low quality care (differences) between hospitals and should not be adjusted for. Within-hospital differences in care can be seen when low SES patients are less likely to receive quality care or have higher

utilization compared to higher SES patients in the same hospital. If the literature around the selected variables suggests their influence impacts either within or between hospital differences, this will help guide the Committee on whether the factors should be included in the model.

- The Committee cautioned that when factors are include in the risk-adjustment model, changes in the R^2 value does not implicitly mean that SDS should or should not be included. They suggested that the changes in the R^2 could be due to the measure construct or the risk adjustment model. Improving the R^2value does not mean the measure is better if the factors included do not have a conceptual link that is supported in the literature. Given that cost measures lack directionality without benchmarking or a link to quality, it is important that the decisions on factors are supported by the literature to help with interpretability of the results.

Conceptual Analysis of the Variables

The Committee was then asked to frame their discussion of each variable around the following questions in order to facilitate their thinking about the conceptual relationship of each variable to payment.

- Does prior research indicate a relationship between SDS and the outcome?
- Is there a logical rationale or theory about the relationship between SDS and the outcome?
- Is there a significant passage of time between the healthcare unit intervention and measured outcome during which other factors may have an effect?
- Do patient actions or decisions influence the outcome or process and are the decisions affected by SDS factors (e.g., ability to purchase medications)?
- Does the patient community have an influence (e.g., distance to pharmacies, groceries, healthcare services)?
- Has the developer adequately demonstrated that there is (or is not) a conceptual relationship between the risk factors and the payment/resource utilization/cost for each measure or condition (e.g., pneumonia, AMI, HF)? (i.e., Does the Committee believe there is a conceptual relationship?)
- How well do these variables proxy for the intended SDS factors and align with the conceptual model?
- If there is a conceptual relationship, are the data available, feasible, and accessible (for this population) in order for these factors to be used in empirical testing of risk-adjustment?
- Based on the conceptual analysis provided by the developers, does the Committee believe that further empirical analysis is warranted? If so, which factors does the Committee recommend the developers pursue in the empirical analysis?

The table below summarizes the Committee's discussion for each of the variables in relationship to the key questions guiding the conceptual analysis:

	Income/Educational Attainment (from Census data using 5-digit ZIP code)	**Medicaid/Dual Eligibility Status (Medicare/Medicaid data)**	**Black Race (Medicare data)**
Does prior research indicate a relationship between SDS and the outcome?	Based on the literature review submitted by the developers, the Committee agrees there is a complex, multi-directional relationship between this factor and payment supported by the literature.	Based on the literature review submitted by the developers, the Committee agrees there is a complex, multi-directional relationship between this factor and payment supported by the literature.	Based on the literature review submitted by the developers, the Committee agrees there is a complex, multi-directional relationship between this factor and payment supported by the literature. The Committee suggested the developers further explore the literature related to this variable and within and between hospital differences. Yale is open to other suggestions of literature that may help them better understand this relationship.
Is there a logical relationship or theory about the relationship between SDS and the outcome?	Committee agrees there is a complex, multi-directional relationship between this factor	Committee agrees there is a complex, multi-directional relationship between this	Committee agrees there is a complex, multi-directional relationship between this factor

	Income/Educational Attainment (from Census data using 5-digit ZIP code)	Medicaid/Dual Eligibility Status (Medicare/Medicaid data)	Black Race (Medicare data)
	and payment.	factor and payment.	and payment.
Is there a significant passage of time between the healthcare unit intervention and measured outcome during which other factors may have an effect?	Yes. The measure includes a 30-day post discharge period.	Yes. The measure includes a 30-day post discharge period.	Yes. The measure includes a 30-day post discharge period.
Do patient actions or decisions influence the outcome or process and are the decisions affected by SDS (e.g., ability to purchase medications)?	Yes	Yes	The Committee did not address this question.
Does the patient community have an influence (e.g., distance to pharmacies, groceries, healthcare services)?	Yes	Yes	Yes
Has the developer adequately demonstrated that there is (or is not) a conceptual relationship between the risk factors and the payment/resource utilization/cost for each measure or condition (e.g., pneumonia, AMI, HF)? (i.e., Does the Committee believe there is a	Committee agrees there is a multi-directional relationship between this factor and payment. The Committee did not have adequate time to address this question for each condition.	Committee agrees there is a multi-directional relationship between this factor and payment. The Committee did not have adequate time to address this question for each condition.	Committee agrees there is a complex multi-directional relationship between this factor and payment. The Committee did not have adequate time to address this question for each condition.

	Income/Educational Attainment (from Census data using 5-digit ZIP code)	Medicaid/Dual Eligibility Status (Medicare/Medicaid data)	Black Race (Medicare data)
conceptual relationship?)			
How well do these variables proxy for the intended SDS factors and align with the conceptual model?	Some studies suggest that census data linked though a 5-digit ZIP Code may not be sensitive enough to allow for imputation of patient-level educational or income status. Committee members suggested considering other factors that could be used instead. Census block data would be more useful. Yale is working on getting access to 9-digit ZIP code data, but will not have access to it by October (the scheduled deadline for the empirical analysis). The 9-digit zip can be linked to census data. Yale will not be able to get access to patient address data, which would allow them to link to educational and income data at the census block level. When adjusting for education	Yale proposes using Medicaid (dual eligibility) status as proxy for both low income and insurance coverage for some post discharge services. Committee members suggested that the Medicaid variable alone may not be useful as a proxy for the suggested variables. However, they suggested doing empirical analysis with this variable and with the low income supplement (LIS) data that are available in Medicare data.	The use of the black race variable because the other race variables are not very robust. Could be a measure of direct discrimination so would not want to adjust. Using the black race variable in this measure is likely a proxy for neighborhood and resources, income and education (they are highly correlated in the research), in which case it would not be appropriate for use in risk-adjustment

	Income/Educational Attainment (from Census data using 5-digit ZIP code)	Medicaid/Dual Eligibility Status (Medicare/Medicaid data)	Black Race (Medicare data)
	and income using census block data, a neighborhood affect is also being captured.		
If there is a conceptual relationship, are the data available, feasible and accessible (for this population) in order for these factors to be used in empirical testing of risk-adjustment?	Yale currently only has access to 5-digit zip code data. The Committee, however, would prefer the developers use 9-digit zip code data. Yale is unsure of when they would have the 9-digit zip data, but it would likely not be in time for them to do analysis for the October webinar.	While the Committee expressed some concern about the variability of the Medicaid data from state to state, Yale does have access to these data.	Yale has access to the Medicare race variable. However, they made the decision to only use the black race variable. Committee members suggested that Yale explore the use of the other race variables for a more robust analysis.
Based on the conceptual analysis provided by the developers, does the Committee believe that further empirical analysis is warranted? If so, which factors does the Committee recommend the developers pursue in the empirical analysis?	Income and educational attainment: The Committee was not in favor of the developers beginning empirical analysis using 5-digit zip code data. The Committee would prefer for the developers to use their resources analyzing the 9-digit zip code data once it is available to them.	Medicaid/dual eligibility status: The Committee was in support of empirical analysis on this (Medicaid status) variable, but only in combination with the low income supplement (LIS) data as proxy for insurance status and income.	Black Race: If race results in differential treatment, it should not be included in the adjustment. If patient care is consistent across races, it can be adjusted for. Further literature review is needed to determine the within and between effects of race on hospital performance. Exploratory empirical analysis

	Income/Educational Attainment (from Census data using 5-digit ZIP code)	Medicaid/Dual Eligibility Status (Medicare/Medicaid data)	Black Race (Medicare data)
			across all hospitals to see if there is a negative affect with this variable included would be useful as well. The focus of analysis for this variable should be on within and between hospitals how much difference is there between black and non-black patients. The Committee also recommended that the Yale team review the data and consider other including other race variables beyond black.

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Meeting Summary

Summary of Committee Recommendations

- Broaden the conceptual model and literature review to see if there are other factors that could be considered.
- Variables:
    - The Committee suggested that the developers consider other variables including: housing instability and disability status.
    - Black Race: Further literature review is needed to determine the within and between effects on hospital performance. Exploratory empirical analysis across all hospitals to see if there is a negative affect with this variable included would be useful as well. The Committee also recommended that the Yale team review the data and consider other including other race variables beyond black.
    - Income and educational attainment: The Committee was not in favor of the developers beginning empirical analysis using 5-digit zip code data. The Committee would prefer for the developers to use their resources analyzing the 9-digit zip code data once it is available to them.
    - Medicaid/dual eligibility status: The Committee was in support of empirical analysis on this (Medicaid status) variable, but only in combination with the low income supplement (LIS) data as proxy for insurance status and income.
- As a future goal, Committee members would like to see efforts made toward acquiring better geocoded data to address SDS variables.

Next Steps

- NQF will work with developers to determine how and when the Committee's recommendations can be implemented and shared back to Standing Committee for consideration.
- NQF will work with the Yale developers to determine whether the October webinar remains a feasible deadline for a follow up discussion on the empirical analysis and determine an estimate for obtaining the 9-digit zip code data.
- The Yale developers have agreed to perform further reviews of the literature per the Committee's recommendations.