NATIONAL QUALITY FORUM
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Meeting Summary

Best Practices for Developing and Testing Risk Adjustment Models Web Meeting #4

The National Quality Forum (NQF) convened a public web meeting for the Best Practices for Developing and Testing Risk Adjustment Models Technical Expert Panel (TEP) and the NQF Scientific Methods Panel (SMP) on May 13, 2021.

Welcome, Introductions, and Review of Web Meeting Objectives

Dr. Matthew Pickering, NQF Senior Director, began by welcoming participants to the web meeting. Dr. Pickering provided opening remarks and invited Co-chairs Philip Alberti and Karen Joynt Maddox to provide welcoming remarks. Janak Panchal, NQF Manager conducted roll call and acknowledged that members from NQF's SMP were present on the call to contribute to the discussions related to the Technical Guidance report. Dr. Pickering then reviewed the meeting agenda and the following meeting objectives: obtain TEP input on the first draft of the Technical Guidance report, continue discussion on the appropriateness of a standard risk adjustment framework, including rationale for or against the use of the same set of risk factors for quality and resource use measures; and discuss emerging good and best practices for social and functional status-related risk adjustment.

Web Meeting #3 Recap

Dr. Pickering provided a recap of web meeting #3, which was held on April 2, 2021. Dr. Pickering noted that the main objectives of web meeting #3 were to review and discuss public comments on the Environmental Scan report, review and discuss the draft Technical Guidance (TG) outline, and discuss the appropriateness of a standard risk adjustment framework.

Dr. Pickering thanked the TEP for their feedback on the Environmental Scan report. At this time, the Environmental Scan report is now finalized and posted publicly on the project page. During web meeting #3, the TEP discussed the appropriateness of a standard risk adjustment framework. Overall, the TEP agreed that a framework will be beneficial but noted that due to data limitations and differences in outcomes and target populations, it will be extremely difficult to build a one-size-fits-all framework. Additionally, a standard risk adjustment framework will need to continue to meet the needs of evolving methods and approaches in healthcare quality measurement as it relates to risk adjustment. Dr. Pickering noted that the TEP agreed that the standard framework should be a set of minimum requirements. NQF staff have attempted to draft these minimum requirements as minimum standards within the TG draft report, which will be what the group discusses during the call.

Review TG Report Comments – Joint TEP and NQF SMP Discussion

Dr. Pickering outlined the following TG report sections for discussion:

- Conceptualizing the Model
- Describing the Rationale for Risk Adjustment
- Identifying and Selecting Potential Data Sources and Variables
- Empirically Testing Risk Factors
- Empirically Testing the Adequacy of the Risk Model

- Considerations for Determining the Final Risk Adjustment Model

Prior to the web meeting, the TEP was sent draft minimum standards and a series of questions (outlined below) related to the sections noted above. The purpose of the questions was to gain input on the draft minimum standards within the TG report and to further elucidate additional minimum standards accordingly. During the meeting, the Co-chairs provided a brief summary of the comments and responses received from the TEP for each section and allowed for additional discussion and input from both the TEP and SMP members present on the call.

Please note: The minimum standards that are listed within this summary were what the TEP and members of the SMP reviewed and discussed during the web meeting. They are not to be considered final. These minimum standards and various aspects of the TG report itself will be updated accordingly, based on the TEP-input received and the input received through public comment.

Conceptualizing the Model

Minimum Standard:

> *A conceptual model is required and should illustrate the pathway between the social and/or functional status-related risk factors, patient clinical factors, quality of care, and the measured healthcare outcome.*

Co-chair Philip Alberti summarized that there were no suggested edits or comments received prior to the web meeting from the TEP on this minimum standard. Dr. Alberti inquired if SMP members had comments or disagreements to share. The TEP and members of the SMP agreed with its phrasing and inclusion in the TG report.

Variable Selection for Examination

Minimum Standard:

> *At a minimum, developers should consider age, gender, race/ethnicity, urbanicity/rurality, Medicare and Medicaid dual-eligibility, and AHRQ SES Index score for the analysis.*

Dr. Alberti shared that no comments or edits were received from the TEP prior to the meeting. Opening the floor for discussion, the TEP noted that only social risk factors were listed and that there should be mention of functional risk factors as well. Additionally, the TEP shared that some of the risk factors refer to specific data sources, which can present challenges due to data availability. TEP members agreed that the minimum standards should not be too prescriptive with data sources. Taroon Amin, NQF Consultant, shared that NQF aims to be specific without being prescriptive and will look to the TEP on methods to achieve this. TEP members suggested using phrases that include "such as" when listing data sources to include. The TEP further suggested providing some illustrative examples and including an appendix of potential sources. TEP members also suggested that the text of the report should be clear that these risk factors should be considered, but not all will necessarily be included in the final risk adjustment model due to challenges with data availability, for example.

Identifying and Selecting Potential Data Sources and Variables

Minimum Standard:

> *Document and fully disclose data sources, including the dates of data collection, the manner of data cleaning and manipulation if done, and the data's assumed or confirmed quality. Developers can cite other research to show data quality of those variables.*

Dr. Alberti shared that no comments or edits were received from the TEP prior to the meeting. During the discussion, the TEP recommended that developers should add a description of the populations

covered by the data set and to be explicit about any limitations of the data source. Additionally, the developer should disclose whether any data cleaning was performed. One SMP member mentioned that there is a need for additional research in the field to examine whether data sources are truly reliable so that developers can cite unbiased literature.

Minimum standard:

> *If social and/or functional status risk factors are not available, but included in the conceptual model, provide a rationale as to how this will not bias the results.*

Dr. Alberti reported that the TEP did provide feedback for this standard, recommending adding that developers should provide an explanation of any bias that occurred and/or how to mitigate bias. Comments provided by SMP members included a general outlook that members are against the use of proxy variables (e.g., using patient race as a proxy for socioeconomic status). SMP members further proposed that a more ideal approach would be to use the "real" variable that is characterized at a level higher than the individual patient level (e.g., ZIP Code or county). The TEP generally agreed with this approach.

Empirically testing the association between the factor with the outcome

Questions for the TEP:

> *What if the bivariate association is not significant, is that grounds to not include the factor in the model? What about the clinical/practical significance within the conceptual model? What is the downside of keeping variables that are not significant?*

Co-chair Dr. Joynt Maddox reviewed the questions. Comments from the TEP suggested including a recommended sequence of testing of potential predictor variables when building a prediction model to risk adjust outcomes. During the call, one TEP member suggested that bivariate associations are a limited method for demonstrating whether a variable should be included in the model; they are descriptive. Dr. Joynt Maddox asked members of the SMP to share their comments and they suggested proposing a sequence of testing of potential predictor variables when building a prediction model to risk adjust outcomes. SMP members agreed that bivariate associations are not satisfactory for demonstrating inclusion of a variable. Dr. Joynt Maddox summarized discussion points that included agreement from the TEP that bivariate association should not be a minimum requirement nor a deterministic step for including risk factors within risk adjustment models.

Empirically testing in a multivariate model

Minimum Standard:

> *Variable selection criteria for the final risk adjustment model should be the same among all variables considered.*

Questions for the TEP:

- *Should all factors be entered to the model at the same time? Should all factors be kept regardless of significance of the coefficient, knowing that clinical factors are often kept in the risk adjustment model even when coefficient is not significant?*
- *How should developers approach this, given that entering variables incrementally maybe helpful for exploratory purposes because it provides information about the model that may not be available if all the variables are run at the same time?*

Dr. Joynt Maddox shared that feedback from the TEP included proposing to start with control variables, whose influence a developer would want to remove, then including independent variables of greatest theoretical or hypothesized impact in order. From this point, posited mediators and effect modifiers

should be included and results (i.e., beta coefficient changes) should guide decisions about the variables. Additionally, if a variable is removed from the model, it should be tested for its impact on the predictions for subgroups of particular interest for the measure (e.g., socially vulnerable populations).

Assessing the between-entity effects vs. within-entity effects

Questions for the TEP:

> *Is there a best practice for determining effect size for the patient-level and/or entity-level risk factors in a decomposition analysis? If the effect size is higher for one and not the other, then what?*

Dr. Joynt Maddox shared that no comments were received from the TEP prior to the meeting. Opening the floor for discussion, the TEP acknowledged that it is tricky for developers to demonstrate, empirically, whether the case-mix or a measured entity's quality of care is correlated with the prevalence of social/functional risk factors for the particular entity. The TEP did not identify a best practice or minimum standard for this section but encouraged developers to lay out their analyses carefully and clearly. Feedback from the SMP included a desire to focus on either individual patients or a characterization of the community in which patients live rather than characteristics of the entity being evaluated via the outcome measure.

Determining the impact of adjusting for risks (or not) on accountable entities in the tails of the performance distribution

Questions for the TEP:

> *Should developers demonstrate the impact of the social and/or functional risk factor on how categories of performance are defined in the context of its use or application (e.g., performance cutoffs, performance categories)?*

Dr. Joynt Maddox shared that the TEP provided feedback that conveyed general agreement that developers should demonstrate impact across different categories or specific patient groups, potentially via statistical hypothesis testing (e.g., reclassification index).

Question for the TEP:

> *If inclusion/exclusion of social/functional factors changes the rankings (if the rankings change at all, change among 10% entities, etc.), what should developers do?*

Dr. Joynt Maddox shared that no comments or edits were received from the TEP prior to the meeting. Opening the floor for discussion, the TEP and SMP suggested that there is a strong case to include social/functional risk factors in a model when doing so changes the ranking of the evaluated entities compared with the model without these social/functional risk factors.

Empirically Testing the Adequacy of the Risk Model

Questions for the TEP:

> *Does comparing the clinically-adjusted and social and/or functional adjustment in addition to clinically-adjusted AUC inform the decision to include social and/or functional risk factors in the model? How much of an improvement should be expected?*

The TEP agreed that no one test should inform the decision to include a variable or not, noting that the TG report will not give guidance on how much the AUC should change, for example. The TEP advised that developers be transparent, disclosing the changes identified in their tests to demonstrate and rationalize their decision making.

Questions for the TEP:

> *What would we expect in terms of the risk model calibration calculations in subpopulations at risk – how should they be defined? What do we recommend if social/functional status factors are conceptually important, empirically significant, but that the subgroup is not calibrated well?*

The TEP advised defining calibration. For example, it could be defined as: the model predicts what happens correctly on average in total for the subgroup of interest. Calibration should be conducted with subpopulations. If the model is not performing well in a subgroup, it is possible that it should be broken down further and analyzed again as two different subgroups.

The TEP did not discuss the last section, "Considerations for Determining the Final Risk Adjustment Model", due to limited time remaining during the meeting. Dr. Pickering mentioned that another version of the report with updated standards will be shared with the TEP for their review and feedback.

Public Comment

Janaki Panchal, NQF Manager, opened the web meeting to allow for public comment. No public comments were offered. Rachel Harrington shared that NQF should be mindful of the expectations being created regarding the need for statistical sophistication. Dr. Pickering thanked Rachel for her comment and shared that key informant interviews with measure developers will occur if NQF is awarded an option year. During the option year, NQF will be able to gauge the potential burden and utility of the guidance with developers through these interviews.

Next Steps

NQF staff shared that Web Meeting #5 is currently scheduled for July 14 from 1:00-3:00pm ET. This will be the final web meeting for the base year of the project. During this web meeting, the TEP will review the public comments received on the Technical Guidance report. NQF staff shared the contact information for the project and adjourned the meeting by thanking the TEP for their continued participation and engagement.