Case Study: Developing a Condition-Specific Utility Measure

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Utility and health preference measures are used to value health outcomes of interventions for clinical studies and cost-effectiveness analyses. When valuing the outcomes of certain treatments, sometimes generic health preference measures may not be the best choice. For example, a key challenge for most generic measures, such as the EQ-5D and the SF-6D, is that they do not completely capture the variations in outcomes for ocular conditions. Evidera and a team of individuals from industry and academic centers developed a new health preference measure designed to assess utilities for ocular conditions. We developed an approach for estimating health state utility scores based on responses to the NEI Visual Function Questionnaire 25 (VFQ-25) — the VFQ Utility Index (VFQ-UI).[1,2]

NEI VFQ-25 data from patients with central or peripheral vision loss were used to identify subsets of items covering important concepts underlying vision-related functioning. A Rasch analysis was performed to identify the subset of items representing varying severity levels for both peripheral and central vision loss. The Rasch analysis examined unidimensionality of the responses, using item fit statistics, threshold maps, category probability curves, and item characteristic curves. NEI VFQ-25 data from multiple central vision loss and peripheral vision loss studies were used for these analyses (n~3,000). The data were examined separately, identifying items that best fit each type of vision loss. Finally, we combined the datasets to identify the final set of items that had the best psychometric properties for both central and peripheral vision loss. The final selected NEI VFQ-25 items are summarized in *Figure 1.*

Health states based on the selected items were developed to represent the range in vision-related functioning. These health states were then valuated with a time trade-off procedure using members of the general public in Australia, Canada, the United Kingdom and the United States. Approximately 150 participants were interviewed in each country. Finally, the multinational valuation dataset was analyzed to create the VFQ Utility Index scoring algorithm.

A complex series of analyses were

FINAL ITEMS & CONCEPTS FOR VFQ-UI HEALTH STATES	
Item	*Concept*
See well up-close	Near vision
See people's reaction to things I say	Vision-specific social functioning
Going out to movie, play, sports event	Distance vision
Limited work time due to vision	Vision-specific role difficulty
Stay at home because of eyesight	Vision-specific dependency
Worry about doing things that will embarrass me or others	Vision-specific mental health

figure 1

completed since the different concepts reflected in the selected items were partially dependent on each other. We applied item response theory (IRT) analyses to obtain an indicator of severity for each health state defined by the VFQ-UI classification system and then mapped the severity indicator onto the utilities of targeted study health states. First, we used the data set from Phase 1 to estimate severity (theta) scores from the patient-level responses to the six VFQ-UI items using a graded response model. Theta represents the location of the health states in terms of vision-related function, where higher scores indicate better functioning. Regression models were then conducted to map the relationship between time trade-off (TTO) preference scores and selected demographic variables and VFQ-UI thetas. Different regression models were explored to determine whether linear or nonlinear regressions represented a better fit in estimating TTO scores. These regression analyses were then used to estimate the utility score, and an equation was established for estimating utilities based on responses to the six items on the NEI VFQ-25.

The investigators in the National Health Measurement Study evaluated the one-month change in different generic health preference scores (i.e., SF-6D, EQ-5D, QWB-SR, HUI2, HUI3) after cataract surgery.[3] Cataract surgery usually results in a very large improvement in visual acuity and very good vision-related functioning outcomes in most patients. Since the NEI VFQ-25 was also included in this study, the VFQ-UI was scored and separately analyzed. Based on the results, the SF-6D, EQ-5D, and QWB-SR all demonstrated very little change after one month, with standardized response means ranging from essentially 0 to 0.15. The HUI2 and the HUI3 showed some responsiveness (0.22–0.25), mainly because there are items covering vision problems in those two preference measures. The VFQ-UI was fairly responsive with a standardized response mean of 0.36, and the NEI VFQ-25 was the most responsive with a standardized response mean of 0.77, since it is a very comprehensive measure of vision-related functioning.

In conclusion, an algorithm for converting VFQ-UI scores into health preferences was developed. This vision-related preference score is expected to be more responsive to differences among the effects of ophthalmologic interventions than generic health preference measures. The VFQ-UI represents the patient's perspective on the impact of ocular conditions on functioning and well-being, and VFQ-UI scores allow for comparisons across ocular disorders. These VFQ-UI scores may prove valuable for comparing different vision-related treatments and for estimating quality-adjusted life-years (QALYs) for economic evaluations and health policy decisions.

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