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Objectives

Our economic model predicted long-term best corrected visual acuity (BCVA) in both eyes using data from the 100 week LEAVO study, which compared intravitreal therapy with ranibizumab, aflibercept and bevacizumab for macular oedema (MO) due to central retinal vein occlusion (CRVO). Utilities in LEAVO were collected using EuroQol Five Dimension (EQ-5D), EQ-5D with vision bolt-on (EQ-5D-V), and Visual-Functioning Questionnaire Utility Index (VFQ-UI). We developed mappings to predict utilities beyond the study period using better-(BSE) and worse-seeing eye (WSE) BCVA, age and sex.

Methods

We estimated adjusted-limited dependent variable mixture models with one to four components. To predict utility within the components we included BSE BCVA, WSE BCVA BSE-WSE BCVA interaction, age and sex as independent variables. We considered BSE and WSE BCVA as determinants of component membership. Models were compared using the mean error, mean absolute error (MAE), root mean square error (RMSE), Akaike information criteria (AIC), Bayesian information criteria (BIC) and visual inspection. We plotted predicted versus observed utilities by BSE and WSE BCVA and simulated data to compare cumulative distribution functions.

Results

For all utility measures, including the BSE-WSE BCVA interaction worsened model fit according to BIC. Using BSE and WSE BCVA to predict component membership improved model fit. Including more than 1 component consistently improved model fit. For each utility measure, the mean error, MAE and RMSE were similar between the 2, 3, and 4 component models, but the BIC was lowest for the 2 component models for EQ-5D and EQ-5D-V, and for the 3 component model for the VFQ-UI.

Conclusions

EQ-5D, EQ-5D-V and VFQ-UI are best predicted using models with multiple components in MO due to CRVO. This is consistent with findings from other disease areas, and builds on previous research in visual acuity which have been limited to ordinary least squares regression.