Reviewer's report

Title: Misspecification of the D1 EQ-5D regression model

Version: 1 Date: 9 September 2011

Reviewer: Mark Oppe

Reviewer's report:

It's a nice paper that shows the impact of using different models on the interpretability of the results. It is shown for a specific case (i.e. the D1 model used in the US EQ-5D valuation study) but I think the methods and rationale in this paper can be used in many more applications.

Page 5 (bottom)


Comment: which improvements were made in the US study compared to the UK?

The US study is not from 2001, but from 2003 (published in 2005)

Page 6 (bottom):

Content: "The EuroQol group has recently released official versions of the new EQ-5D-5L, where each dimension can be described at five levels, as opposed to the previous three. Since existing EQ-5D-3L tariffs cannot be used directly on the five level version, it is likely that a number of new national tariffs will be published over the next couple of years, both for countries for which EQ-5D-3L tariffs exist, and for countries without any EQ-5D tariffs."

Comment: I would remove this paragraph because it is possible to use 3L values sets for the EQ-5D 5L: A crossover study between the 3L and the 5L has been undertaken by the EuroQol Group for just that purpose. This allows users of EQ 5D to calculate utilities for the 5L based on 3L value sets. These could be used until the 5L valuation studies are completed.

Page 7 (top):

Content: "242 health states.[4]"

Comment: even though you only need to predict 242 of the possible 243 health states (since state 11111 is 1 by definition) I suggest you replace 242 by 243 in order to avoid confusion for the reader as to the number of EQ-5D states. The description and explanation on page 8 are good and should remain.

Page 8 (top):
"Health state 11111 was given a fixed value of 1, and death was given a fixed value of 0."

Comment: From the text it seems that the anchoring on 11111=1 and death = 0 is related to TTO. It should be made clear that it is a requirement of the QALY model, not of TTO (i.e. in standard gamble, DCE and VAS the same anchor points are used)

Page 9 (top):
Content: "D1"
Comment: should D1 here be D1o?

Page 9 (middle):
Content: "Variable Inflation Factors (VIFs)"
Comment: how do you calculate ViF's? (I for one, never heard of them) include a short description + references of the VIF methodology

Page 9 (bottom):
Content: "D1"
Comment: D1 should be D1o

Page 11 (middle):
Content: "We are not generally opposed to including nonsignificant parameters in such regression models,"
Comment: if parameters are not significant, it means that they are not different from zero. If they are zero the won't have an impact on the model, so why would you not exclude them?

The only reason I can think of is if the predictive power of the model including the non significant terms is better (e.g. if the mean absolute deviation of predicted vs observed values is better for the model with than without these non significant parameters).

Page 11 (bottom):
Content: "The VIF scores for all D1o predictors were larger than those for their D1c counterparts."
Comment: if the model results (i.e. the parameter estimates + SEs) are equivalent, why is it bad to have high values for ViF? the presence of multicollinearity does not seem to effect the model estimation, which is why you would want to avoid it

Page 12 (top):
Content: "increases"
Comment: delete "increases"

Page 12 (top):
Content: "redundancy"

Comment: Elaborate what you mean by redundancy in this situation. "normally" this means that if you have two highly correlated parameters in your model you're effectively putting in the same variable twice, which makes one of them redundant. However in this case, the number of parameters between the models are the same, suggesting there is no redundancy.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.