Reviewer’s report

Title: Independent comorbidity of injury patients in the first year following injury: comparison of three comorbidity adjustment approaches

Version: 1 Date: 15 May 2010

Reviewer: Pieter HM van Baal

Reviewer’s report:

The paper presents results of data analyses intended to test interactions of disease combinations with respect to EQ-5D values. The authors have done these analyses within the context of BOD/HALE calculations in which disease specific results are combined using some assumptions. I have two major comments, and addressing them would require a complete rewrite of the paper and a complete re-analyses of the data.

Major comments:

1. Comorbidity may complicate BOD and HALE calculations for two reasons. The first one is the quantification of the comorbidity problem: how frequently do combinations of diseases occur? Secondly, what is the impact of combinations of diseases on health related quality of life/disability weight (To what extent differs the total from the sum of its parts?) This paper addresses only the second question, but the title and introduction do not suggest this (actually, the title does not suggest anything, as no mention is made what is being adjusted...). However, a large portion of the background section is spent on explaining different types of comorbidity but no mention is made of relevant empirical literature regarding interactions between diseases wrt to quality of life (see for example http://www.hqlo.com/content/3/1/2). Since the paper deals with interactions of diseases wrt EQ-5D values I do not understand why it matters for individuals if the conditions they have are unrelated or not. Also in the results presented I did not see any relevance of these distinctions wrt different types of comorbidity.

2. I had to read the methods section several times and I still have the feeling I do not understand exactly what the authors have done. I am, however, convinced that the research can be better tackled using a more standard statistical approach. To quantify/test the impact of disease combinations on EQ-5D values, statistically one should simply estimate and compare different regression models with EQ-5D values as outcome variable and diseases and interactions between diseases as explanatory variables. One can then compare models in terms of fit using some criterion or test the coefficients for the interaction terms. A GEE or random effects model should be used to account for the repeated measurements design. Furthermore, one should really think about how to model the outcome measure and the appropriate link function (possibly a two part model).
Based on the predictions of the 'best' models for the included diseases (and combinations thereof) one can say something what adjustment wrt disability weights seem most appropriate.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.