

Author's response to reviews

Title: Using Linked Data to Calculate Summary Measures of Population Health: Health-adjusted Life Expectancy of People with Diabetes Mellitus

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PDF covering letter

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RE: Using Linked Data to Calculate Summary Measures of Population Health: Health-adjusted Life Expectancy of People with Diabetes Mellitus

Dear Editors:

Thank you very much for considering our paper for publication. We appreciate the helpful comments from both you and the reviewers. We have addressed all of the comments into the revised manuscript as summarized below.

We have added a reference for the actual MS EXCEL spreadsheets containing the life tables that were used in the study. We recognize that they are a potentially useful resource to readers in terms of: 1) further understanding the study method; 2) as a resource for estimating or modifying estimates diabetes (DM) health-adjusted life expectancy (HALE); 3) other applications for estimating the burden of DM that arise from other life table functions; 4) as a template for estimating life and health expectancy for other populations and conditions.

Editor's comments:

1) Both editors and both reviewers were interested in the differences between self-report and physician diagnosed DM. As Reviewer 1 noted, there are three potential ways that DM could be defined in our paper: self-report from the population health survey (OHS); physician-diagnosed in the diabetes registry (ODD); and from leading-cause of death on the death certificate. The estimates of HALE and life expectancy (LE) used only the physician-diagnosed ODD definition. We have added a comparison of the estimated HUI values for self-report versus physician-diagnoses. Since our study used the definition that has been most extensively validated and consider the "gold standard" and comparison of the methods of diagnosis is quite a lengthy process, we feel that extensive comparison of self-reported and physician-diagnosed definitions would be better suited to a separate paper – as is the usual case in the literature (see references). Of particular note, Hux et al. have compared the ODD to self-reports (using the same survey data as our study) during the validation of the ODD (reference 16).

To address the issue of definitions of DM and the relationship between the ODD and self-report we have done the following:

- Clarified which definition was used throughout the manuscript (physician-diagnosed)
- Added a comparison of the Health Utilities Index (HUI3) for self-report and physician diagnosed DM.
- Added discussion on the different ways to define DM and the impact on estimates of health burden.
- Added to the Abstract reference to the HUI estimates for self-reported versus physician-diagnosed DM.

2) We have expanded the method section pertaining to the derivation of the HUI3. The scoring system that we present is the most current. The multiplicative form that we show is slightly different from earlier forms that have also been published.

Reviewer 1

- 1) Sampling variability – we have added sampling variability including confidence interval to all estimates, including HALE.
- 2) Compare the HUI levels for both self-reported and physician-diagnosed people with DM. Done (see above). Compare mortality in the same manner. The sample size for the self-reported DM people is small and precludes this comparison.
- 3) Add the HUI levels for the self-reported and non-DM population in table 2. Done.
- 4) On page 11, clarify the use of study data for surveillance. We agree that the reviewer that the study data sets address many previous concerns that health expectancy has a limited role for health surveillance. We have described these potentials.

Reviewer 2

- 1) Clarify whether the OHS is telephone-based. Done.
- 2) How complete is the register? The register should represent over 95% of the physician-diagnosed people with DM. This has been added.
- 3) How long is the study period. The study period was 1996/97. This has been clarified.
- 4) Clarify the methods of the HUI. The HUI has been described in much greater detail, including the method of assigning preference weights (time trade off and visual analogue scale).
- 5) Provide a greater comparison to the disability weights in the WHO GBD. We agree with the reviewer that the HUI3 utility weight should be lower than the WHO GBD disability weight for uncomplicated DM since the HUI3 weight includes all disease states, including complications. However, since the prevalence of blindness (0.1%) and other complications is low for people with DM in Ontario, they should have a small influence in overall HUI3 estimates. We have clarified and discussed these relationships in the results section. In table 2, we present the prevalence of the different DM states in the OHS II to allow the reader to gauge the contribution of each sub-group (ie. diabetic foot, blindness, etc.) These prevalence measures also help the reader understand the benefits and limitations of the survey data compared to the WHO BOD project. Namely, survey data easily estimate utility-values of HRQOL for age, sex and other subgroups (ie. SES, ethnic origin) but can not estimate groups that are not easily identified in the survey (diabetic foot, people with unrecognized DM).

6) Should the discussion focus on the comparison of Canadian and WHO HALE estimates? We are unaware that the WHO has estimated disease-specific cause-deleted HALE estimates, instead preferring DALYs as a health gap measure. We have rewritten the discussion to focus on the data sources used to create SMPH as opposed to discussing which measure is preferable. This is difficult because these two issues (measures and data) are quite tangled – data can be used or adapted to estimate either measure, such as the approach of the WHO to estimate overall HALE by combining disease-specific data used to calculate disease-specific DALYs. We have rewritten the discussion to provide greater clarity and distinction of the data sources, which is the main contribution and emphasis of our study.

7) Clarify the comorbidity adjustment. Can people without DM have other diseases – or is it a selected completely disease-free sub-population. People without DM can have other diseases. This point has been clarified.

8) From the “general discussion” comments of the reviewer, it is apparent that we were unclear about the use of self-reporting DM status. As previously mentioned, we have clarified this throughout the manuscript, including the first paragraph of the results on Page 7 that was particularly confusing. We did not use ‘self-reports’ to establish utility weights, indeed a main purpose of the study was to overcome self-reporting by linking survey data to the physician-diagnosed DM registry.