Reviewer's report

Title: Projection of the Year 2050 Burden of Diabetes in the U.S. Adult Population: Dynamic Modeling of Incidence, Mortality, and Pre-Diabetes Prevalence

Version: 1 Date: 20 August 2010

Reviewer: Goodarz Danaei

Reviewer's report:

General comments:
Boyle and colleagues have used high-quality and recent data on incidence and prevalence of diabetes from CDC estimates and mortality from vital registration and provided projections for diabetes prevalence in the US using a set of difference equations constructing a discrete time state-transition model. Their model is based on a set of assumptions that are supported by previous analyses or observations. They have addressed the major potential concerns about the models and their parameters and have interpreted their results in the context of previous studies and discussed the major implications of their forecasts. I think this study is a valuable contribution to the literature on diabetes modeling and projection and I have several minor comments on the manuscript.

Minor Essential Revisions:
1- I think the authors should provide an overall summary of the models and assumptions in the main text.
2 - P23: the parameters q(t), s(t) and w(t) have not been defined in the appendix.

Discretionary Revisions:
1 - I suggest that the authors use "preventive intervention" instead of intervention.
2 - It may be useful to add the potential another intervention where primary prevention of diabetes is modeled based on the effects reported in prospective observational studies (1, 2). Although I understand that this may require substantial changes to the models and a whole new analysis.
3 - The proportional reduction in the incidence of diabetes after preventive interventions is fairly conservative. The evidence from half a dozen randomized clinical trials of life-style interventions shows a reduction between 30 and 70 percent in incidence of diabetes in the prediabetic population after 1-6 years (3-11). So, I think the authors can claim a 50% reduction in risk based on these trials.
4 - Page 10: I think the authors should explicitly mention in the Methods section that their prior distribution for # assumes that the incidence of diabetes won't decline.
5 - Page 11: The last sentence of the second paragraph "We believe it is.." is hard to read.

6 - Page 12: The reduction estimated for the preventive intervention reduces the number of diabetes cases by less than 10% and still the authors have interpreted this reduction as "considerable". I suggest using a milder language in interpreting this estimate especially considering that the intervention is assumed to reach 100% of those in the high-risk group and uncertainty of the estimates has not been quantitatively evaluated.

7 - The title of the Y axis of Figure 1 should be "Incidence cases per 1000 person years".

8 - Abstract, last sentence of the Results: I suggest the authors report the number of cases prevented by the intervention in some year or range of number of cases prevented during the period.

References


9. Dyson PA, Hammersley MS, Morris RJ, Holman RR, Turner RC. The Fasting Hyperglycaemia Study: II. Randomized controlled trial of reinforced healthy-living


**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.