Reviewer’s report

Title: Economic burden of diabetes mellitus in the WHO African Region

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Reviewer: Ken Redekop

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The aim of the study described in this article was to estimate the economic burden of diabetes mellitus in the WHO African region. The first step described is the choice of conceptual framework, and the authors indicate the choice of using the cost-of-illness approach. Subsequently, the different components in this approach are introduced and applied. The authors conclude that diabetes imposes a substantial economic burden on countries in the WHO African region. In contrast to the results reported by a similar study of the Latin American region where most of the costs were indirect costs, this study found that the large majority of the economic burden in Africa is caused by the direct costs of diabetes.

For a number of reasons, diabetes an important chronic disease not only in developed countries but also in all sorts of countries throughout the world. Therefore studies that estimate and describe the cost of illness are certainly worthy of publication. Since relevance for publication is high, my comments focus in particular on the quality.

Major Compulsory Revisions

1. More references and better documentation
One important shortcoming in this article is the lack of references for key elements used to estimate economic burden. Since certain parameters have an extremely influential impact on the estimate of burden (e.g., the percentage of diabetes patients using insulin), it is important to discuss the validity of the values used. Even better, the authors should estimate the economic burden using the upper and lower limits for these input parameters. For example, what would be economic burden be if one were to use the lowest likely percentage of insulin users? There should be more use of tables to describe the values used in the calculations as well as the data sources for these values. After all, if all of the values for all of the input parameters were to be based on assumptions, how valid would any estimate of economic burden be? This kind of documentation helps the average reader to distinguish between a value based on a published epidemiological or clinical study and a value based on assumptions.

2. Calculation errors
There appears to be at least one critical error in the calculations and these errors need to be corrected before any interpretation of the results. In particular,
something seems to have gone wrong with the calculation of the costs of insulin since the average annual costs per insulin user now seem to be about $35,000. This estimate has far-reaching effects for the entire analysis. Another subtler example relates to the use of insulin. The authors used 14,600 IU of insulin per year in their calculations, and refer to Barcelo et al (2003). However, Barcelo et al appear to have used 10,000 IU per year (p.20) and they refer to a study by Philips & Salmerón (1992) focussing on Mexico.

3. More refined analytic approach needed
Any reader who compares the approach used by Barcelo et al. (Bull WHO, 2003, ref#4 in manuscript) with the approach used in this manuscript will see a number of important methodological differences. One difference is the fact that Barcelo et al. stratified countries in Latin America and the Caribbean according to per capita gross national product (GNP) and then proceeded to obtain costs for different cost components for one or two countries in each group. A similar method could have been considered for the present study. Lack of data only means that certain cost components for certain types of countries are not available. This approach would avoid mismatches such as assuming that the average costs of diabetes tests from a Nairobi private hospital are representative of the average costs of the entire WHO African region.
Also, this study seems to have ignored the costs of complications entirely (unlike, for example, Barcelo et al, 2003).

4. The so-what and the what-next
There is very little reflection on the implications of these findings. What do these estimates of economic burden from diabetes mean for governments? What can they do to reduce the burden? Also, where should future research be focussing, what are the biggest gaps in the data? One common message seen in many economic studies of diabetes is that better diabetes care can reduce the frequency and costs of diabetes complications such as cardiovascular disease. Note that the present discussion will need to be changed after the above issues have been addressed. For this reason, it is premature to comment on the validity of some of the statements made in the Discussion section.

5. More discussion about importance of the study limitations
Some distinction should be made between critical limitations and less important ones. Many of the various assumptions required to estimate overall economic burden represent critical ones.

Minor Essential Revisions

1. Reference 2 needs to be modified slightly and should include more information such as date accessed.

2. Figure 1 is much less important than tables that document the values used in the analyses as well as the data sources. See similar articles for ideas (e.g., Barcelo et al., 2003).
Level of interest: An article of importance in its field

Quality of written English: Acceptable

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