Reviewer’s report

Title: Clinic and patient variation in intermediate clinical outcomes for type 2 diabetes: a multilevel analysis

Version: 0 Date: 11 Sep 2018

Reviewer: Mark Ashworth

Reviewer's report:

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Thank you for asking me to review this interesting paper. The overall message is a strong one - that variation in achievement of intermediate DM outcome indicators is largely unrelated to clinic level effect and almost entirely due to individual patient level factors.

1) Line 110. Malaysia has a spectacularly high prevalence if DM at 17.5% of the population. This should be discussed. Are the individual factors that contribute to this high prevalence also the individual factors that contributed to poor achievement of the selected 3 outcome measures?

2) Line 156: this study was conducted in public health clinics. Further description is required of the Malaysian healthcare system. Who attends public clinics, are they free at the point of use, are they insurance funded or tax funded? And what is the alternative - presumably private? And approximately what proportion of patients with DM attend each service?

3) Line 162: further description is needed of the staff providing DM care. It is unclear what qualifications the Medical Officer and FMS have; and whether they have postgraduate training in the provision of DM care?

4) Line 201: DM complications are addressed in a very broad group. Thus microvascular complications include cataract, retinopathy, CKD, neuropathy, ED, foot ulcer, amputation. Its very large. I was left wondering whether a sensitivity analysis would help? It might be possible that the observed lack of difference between clinics in this study was the result of such broad criteria. For example, an analysis of CKD alone (a commonly used intermediate outcome) might have been highly dependent on the clinic level, rather than patient level. Similarly, foot complications, a very treatable outcome, might have been highly dependent on clinic level variation but this got 'lost' in the analysis because it was lumped together with ED and cataracts (which are not likely to be greatly related to clinic level aspects of care).

5) Line 230: "For the regression analyses, eight continuous variables were centered on their grand mean". This struck me as an unusual approach for constructing regression models. I did not entirely understand it. ?needs further explanation.
6) Line 247: only 2960 out of 5425 patients were included in the study because of incomplete data. We need to know whether this might have led to selection bias. What are the characteristics of excluded patients? Maybe the lack of clinic variation in the study was in part due to the fact that only those with a strong record of clinic attendance (complete records) were included and perhaps key differences between clinics were not detected because some clinics were, for example, not welcoming/accessibe, and the experience of these patients has not been included. The study design in this respect cannot be altered. But the potential limitations and consequences of those limitations need further elaboration in the Discussion.

7) Line 272: at several points in the paper, the authors refer to 'average'. This needs to be more precisely described as 'mean'.

8) Line 326: the paper refers at several points to 'national targets' for the 3 intermediate outcome measurements included in this study. These targets need to be compared to international targets so that we can assess whether these are 'high' or 'low' targets compared to international norms.

Hope comments of help

Mark Ashworth

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

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