Reviewer's report

Title: Neighbourhood immigration, health care utilization and outcomes in patients with diabetes in a metropolitan region (Canada): a population health perspective

Version: 2 Date: 15 December 2014

Reviewer: Christopher Mcleod

Reviewer's report:

Overall this is a well conducted study that creates and examines the effect of three indices measuring neighbourhood-level (or DA-level) immigration concentration and social and material deprivation on health outcomes and health care utilization in a cohort of individuals with diabetes.

The methods, with the exception of the one caveat described below, are rigorous, well described and appropriate to the research question and study design. The study is creative and innovative in the use of linked clinical, administrative and neighbourhood level data.

Below I outline my comments and revision that I think would improve the manuscript.

Major essential revisions

1) The article as currently written has a very generic purpose, with the research being presented as exploratory or descriptive in identifying why neighbourhood immigrant characteristics and social and material deprivation may matter to health outcomes and health care utilization in a population of diabetics. Moreover the conceptual relationship between the 'immigrant score' and material and social deprivation in not well described. In other words, the conceptual motivation for this study is not well developed or articulated. The objectives of the study need to be clearer, conceptually motivated and expressed in hypotheses that are developed from relevant neighbourhood effects and HCU literature. Not only will this help in the framing of the study, it will also help regarding the interpretation of the study results in the discussion.

2) Overall the statistics and methods in the paper are appropriate and rigorous, however there is some detail lacking on a few methodological decisions and statistical models. In particular the justification for emergency visits (4), GP visit (22) and SP (4) is incomplete. While some justification is provided to the GP visit cut-off, these cut-offs seem arbitrary raising the question of whether the findings are influenced by choice of cut-off. HCU data are count data and often analyzed using count data models such as negative binomial model or two-step models that account for high proportion of non-users in a data. These models may be more robust to an arbitrary cut-off. Note that I am not suggesting that the authors adopt a different statistical model, per se, but rather that they need to better
justify their current statistical approach. Second, more detail is required on the multi-level modeling approach. This is to briefly described to assess whether the MLM is correct. Similarly the model underlying the output in Figure 5 & 6 is not well described (line 322 – 334). Inclusion of the general underlying MLM equation would be helpful.

3) The discussion of the results is quite descriptive and can be expanded. First, integration of the various findings can be improved. For example, the results show that there are different effects for GP (-ve), emergency visits (-ve) and SP (+ve). While the relationship between GP visits and emergency visits is discussion, the somewhat contrary finding of increased immigration score being associated with in SP is not. Second, a discussion around what the immigrant index is measuring is lacking as appears to be capturing immigrant tenure in Canada and “mother tounge” and does not take into account immigrant differences that may be due to country of origin. As such this measure might influence the interaction (or lack of interaction as the case may be) between the social and material deprivation indices. It may also limit the generalisablity of the finding outside the study region.

Minor essential revisions

1) Re-write the abstract so the aim of paper is clearer. Immigration score needs to be defined in the abstract as this could represent a wide variety of the measure related to immigrants.

2) Attend to minor language and grammar issues through-out the paper. For example. line 450 – 451 refers to “a most important rate”. Does this mean “highest rate” or something else?

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

Quality of written English: Needs some language corrections before being published

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.