Reviewer's report

Title: What is the comparative health status and associated risk factors for the Metis? A population-based study in Manitoba, Canada

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Reviewer: Sandra Winter

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The authors combine data from a number of administrative data sets to establish a cohort of Metis people living in Manitoba, Canada in order to examine differences in mortality and morbidity firstly between Metis and all other Manitobans and secondly among the Metis. The statistical methodology comprised regression analysis that controlled initially for age and sex to arrive at an adjusted relative risk of death or illness for the Metis and all other Manitobans. The results of this study indicate that the Metis have higher relative rates of death and disease when controlling only for age and gender. Subsequently, logistic regression was conducted to examine the probability of having diabetes, or having a lower limb amputation for these two groups controlling for geography, age, gender, income, continuity of care and the presence of one or more major physical or mental comorbidities. These results indicate that being Metis is associated with a statistically significant higher adjusted odds ratio of having diabetes even after controlling for demographic, health status and healthcare use variables. When looking specifically at diabetes related lower limb amputation, factors other than ethnicity, such as, geographic location, age, gender, household income, the presence of comorbidities and continuity of care may be as important.

In this well written and original article, the authors conduct an important population-based study of the morbidity and mortality of Manitobans, with a particular focus on a minority ethnic group, the Metis. The research question is clearly stated and appears in the title and the abstract. The methods used appear appropriate and are well described. Potential limitations regarding the use of administrative data were discussed. Where possible additional data sets were used to obtain an inclusive cohort of Metis. The article appears well referenced. The discussion and conclusions could be improved as suggested below.

Discretionary revisions
1. The authors note in the results section “The effect of geography is quite profound”. For all Manitobans, living in the North is associated with both a statistically significant increase in the Adjusted Odds Ratio of having diabetes and of having a lower limb amputation. For only Metis, living in The Pas and Thompson regions is associated with a statistically significant increase in the Adjusted Odds Ratio of having diabetes but there is no statistically significant association with having a lower limb amputation. For those readers who are not very familiar with the socio-geographic make-up of Manitoba, it would be useful to provide more information about differences in these regions. For example including a table of aggregate demographic information (income, ethnicity, educational attainment), population density, available healthcare services per 1,000 of the population and classification into primarily urban or rural might be helpful. If word count is a constraint, some of the more historical context regarding the Metis could perhaps be condensed. It would be informative for readers if the authors could suggest possible reasons for these geographical differences more fully in the discussion section.

2. Further discussion seems warranted regarding the role of gender found in this study. For all Manitobans, being male is statistically significantly associated with a slight increase in the adjusted odds ratio of having diabetes, but there is no statistically significant association when examining only Metis. Being male is statistically significantly associated with a much higher adjusted odds ratio of lower limb amputation in the analysis of all Manitobans and only Metis. Do the authors have any ideas as to why this might be the case?

3. At present the discussion section is somewhat difficult to follow going back and forth between the age- and sex-adjusted analysis and the discussion of the logistic regression results of the two population comparisons and the outcome measures of the probability of having either diabetes or a lower limb amputation. The authors should consider reorganizing this section to aid in readers understanding. It would be helpful if the opening sentence of each paragraph stated clearly what was to be discussed, and, where possible, the issues should be grouped together in a more orderly fashion.

4. On the front page there is a footnote explaining why the accent acute would not be used for the rest of the manuscript – but then it is used frequently in the next few paragraphs.

**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