Author's response to reviews

Title: Breast Cancer Screening Disparities among Urban immigrants: A Population-Based Study in Ontario, Canada

Authors:

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Author's response to reviews: see over
Thank you for your valuable comments of May 15, 2015 regarding our manuscript “Breast Cancer screening Disparities among Urban Immigrants: A Population-Based Study in Ontario” (MS:160291477142983). We have addressed all the issues raised by the editor and the three referees (see our responses below) and highlighted our changes in Yellow in our revised manuscript.

Editor's comment:

1) Throughout the results section, it is not clear where the data are coming from and what type of analytic approach was used. For example, in the second paragraph, where do the ARRs come from?  
Response: Information has now been provided regarding the methodology and analysis to provide clarity. Please see section entitled Statistical analyses, Lines 120-145, highlighted in Yellow.

The results described should summarize results presented in tables. Tables 2 and 3 are mentioned but are not included in the manuscript. The figures included are unclear and do not support the description of results. In addition, the title of Figure 1c says “Screening Rates for Total Study” Yet inside the figure the heading is “adjusted ratio ratios for 60-69”. In general, all major results need to be presented in clear tables and the description in the results text should summarize the presented data. If some data are not presented in the tables, but are described in the results text, then please make clear exactly what these data mean and how they were analyzed. Please consider including all results in table regardless to make this section as clear as possible. Response: In our previous submission we presented data for the two age groups (50-59 yrs. vs. 60-69 yrs.) in tables since there were not significantly different and discussed the results for the overall study population (50-69yrs) in the text without including a corresponding table, in order to prevent redundancy. However, as pointed out, this may not be the best approach for clarity. Therefore, we have now streamlined the results section to indicate the specific tables that contain the data, and to indicate where data are not shown in tables. We now include two more tables focusing on baseline characteristics (socio-demographic and health care related factors) and screening rates of the overall study population (50-69 yrs.) by their immigration status and other variables. We have also added a table that provides the ARRs. As a result of these changes, we now have 6 tables instead of three tables. The text covers what has been included in the tables. Please see the new tables 2, 4 and 6, as well as the result section Lines 148-149, 156-160, 165, 168-169, 171-174, highlighted in Yellow. We have corrected the title of Figure 1c as you suggested to reflect the content.

2) In regards to the analytic approach, using Poisson regression, this is of potential concern and more details are needed. First, were assumptions for using this statistical modeling approach met? Second, there are still issues with using Poisson regression when the outcome is common, as described in the paper the author’s reference (21). This should be mentioned in the limitations section. Response. We have included the explanation for the use of Poission regression and its assumption both under statistical analysis and study limitations. Please see Lines 129-134, and Lines 251 - 260, highlighted in Yellow.

3) The statistical analysis section is unclear. Was there more than one outcome in the regression models? Response: No, there was only 1 primary outcome whether the woman had a
mammography within the prescribed look back period (i.e. 2 years). Please see Lines 129-13 highlighted in Yellow.

4) For Poisson regression, the following should be described: (1) definition of the outcome in the models, 2) the type of statistical analysis software used, and 3) the procedure used. What analytic approach was used to get the data in tables 2 and 3, this should be included in the methods. **Response: All the required information have been included under the statistical analysis, Lines 120-145, highlighted in Yellow.**

Referee 1

Title: Breast Cancer Screening Disparities among Urban immigrants: A Population-Based Study in Ontario, Canada

Version: 2

Date: 21 October 2014

Reviewer: Maureen Sanderson

Reviewer’s report:

1. Is the question posed by the authors well defined? **Yes**

2. Are the methods appropriate and well described? **Yes**

3. Are the data sound? **Yes**

4. Do the figures appear to be genuine, i.e. without evidence of manipulation? **Unnecessary**

5. Does the manuscript adhere to the relevant standards for reporting and data deposition? **Yes**

6. Are the discussion and conclusions well balanced and adequately supported by the data? **Yes**

7. Are limitations of the work clearly stated? **Yes**

8. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished? **Yes**

9. Do the title and abstract accurately convey what has been found? **Yes**

10. Is the writing acceptable? **Yes**

Specific comments are below:

1. Line 19 – Spell out ARR the first time used. **Response: Have revised as suggested see Line 19, highlighted in Yellow**

2. Line 143, etc. – Adjusted rate ratios should be presented in tables rather than in separate figures. **Response: Since the other two reviewers did not indicate in their review that figures were unnecessary and visual displays often are easier for readers to relate to we have kept the figures. We**
did however, created another table which displays all the ARRs for overall and two age groups. See Table 6.

3. Line 146, etc. – Trend tests should be presented for variables with more than two levels. **Response:**

> Trend tests are used when we hypothesize there will be a particular trend for variables with three or more levels, but this may lead to loss of ability to detect unsuspected trends. We did not think it was a priority for our study as we were mainly interested in comparing the prevalence of appropriate mammography screening among immigrant and native born women and determining predictors of low mammography screening.

4. Line 154 – Delete Figures 1a-c. **Response:** Since the other two reviewers did not indicate in their review that figures were unnecessary we did not delete them and we strongly feel that visual displays are useful in conveying information.

5. Line 225 – The authors should consider deleting the RR category since the proportion of immigrants is unclear. **Response:** Although the actual proportions are not known precisely, it is small and excluding them means that we will be excluding a considerable proportion of immigrants.

**Level of interest:** An article of limited interest

**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.

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**Referee 2**

**Title:** Breast Cancer Screening Disparities among Urban immigrants: A Population-Based Study in Ontario, Canada

**Version:** 2

**Date:** 5 November 2014

**Reviewer:** Bettina F Drake

**Reviewer's report:**

**Major Compulsory:**

There needs to be some clarification of the variable definitions. It seems as though there would be overlap between “identified immigrants” captured in CIC data and recent registrants. It seems as though there may be identified immigrants in the recent registrants and long-term residents’ categories. **Response:** There is no overlap between “identified immigrants”, “recent registrants” and “long-term residents”. They are mutually exclusive. Please see Lines 99-100, highlighted in Yellow. We have clarified the variable definitions to reflect this (see lines 100-108).
The outcome variable seems to be a dichotomous yes/no for breast cancer screening in the past 2 years. However, they use Poisson regression which should be used for count variables as the dependent variable. **Response:** Our outcome (whether the woman had a breast cancer screening in the past 2 years) is quite common, so logistic regression, which gives odds ratios, would not give accurate values. It would give incorrectly large magnitudes for ratios. In cases where the outcome is common, Poisson regression can be used to calculate rate ratios as long as the follow-up time is the same for everyone, which in our case it was (i.e. in the past 2 years). It will give a conservative confidence interval since Poisson errors are over-estimates of binominal errors, however because of our large sample size the confidence intervals remained relatively narrow. We have provided a reference in the manuscript for the use of Poison regression in similar situations as ours\(^2\) and we have used this method in our other published studies (e.g. Lofters, A.K., Moineddin, R., Hwang, S.W., Glazier, R.H. (2010). Low rates of cervical cancer screening among urban immigrants: a population-based study in Ontario, Canada. Medical Care, 48, 7, 611–618.) which we included in the manuscript and added in the reference list. Please see Lines 234, 247 and Reference #40 in reference list, highlighted in Yellow.

**Minor essential:**

What guidelines are used to support the definition of appropriately screened being one mammogram in the two year period. A reference needs to be provided. The data start at women aged 50. What about women younger than 50? **Response:** This information was included under introduction, please see Lines 38-39 highlighted in Yellow. In Canada the eligibility criteria for undergoing screening mammography starts at age 50 therefor excludes younger women below age 50.

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

**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

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**Referee 3**

Title: Breast Cancer Screening Disparities among Urban immigrants: A Population-Based Study in Ontario, Canada

Version: 2

Date: 1 May 2015

Reviewer: Hung-Wen Yeh

Reviewer's report:

**Major Compulsory Revisions**

1. The predictors of low mammography screening seemed be selected by their confidence intervals (CI) and/or p-values. If so, this may not be appropriate because such large sample size would give very
narrow CI and very small p-values and everything was significant. In this case, effect size of ARR may be more relevant. The authors may rank the effect sizes of predictors and discuss their relative importance. 

Response: The predictors were selected a priori based on our findings from literature reviews and our findings for cervical cancer screening among immigrant women in Ontario (e.g. Lofters, A.K., Moineddin, R., Hwang, S.W., Glazier, R.H. (2010). Low rates of Cervical cancer screening among urban immigrants: a population-based study in Ontario, Canada. Medical Care, 48, 7,611–618.)

2. Conclusion. The authors admitted the current work is limited to address causation (Lines 222 – 223) but made suggestions as if the causal relations have been established. These statements need revision, at least in their tone. Also, the authors made suggestions on multiple risk factors which may be difficult or not economical to implement simultaneously. They may want to suggest future research on (1) causation by causal modeling analysis, and (2) cost-benefit analysis of these recommendations and prioritizing them for policy-makers’ decisions. Response: The conclusion was revised based on suggestion provided. Please see Line 268-293, highlighted in Yellow.

Minor Essential Revisions

Line 154. “... (See Figure 2a, b, c) ...” should be Figure 1a, b, c. Response: It has been corrected as noted. Please see Lines 173 highlighted in Yellow.

Discretionary Revisions

It will help other researchers and reproducibility if the authors specify what software package (including version if applicable) and what computer equipment (e.g. memory, processor) was used to perform analysis. Response: All the required information have been included under the statistical analysis, Lines 143-145, highlighted in Yellow.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests: I declare that I have no competing interests.