Author's response to reviews

Title: Prevalence of smoking during pregnancy and associated risk factors among Canadian women: A national survey

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Author's response to reviews: see over
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Dear Madam/Sir,

Please find attached a copy of the revised manuscript entitled “Prevalence of smoking during pregnancy and associated risk factors among Canadian women: A national survey”, which we are resubmitting for publication in *BMC Pregnancy & Childbirth*. All comments of the reviewers have been addressed below. All modifications in the text have been marked by red color.

Please let me know if you need further information…

Yours sincerely,

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Editor:

Editor: Please be sure to include additional context information into the Background section of the Abstract.

Authors: Acknowledged. More information has been added.

Reviewer 1:

Reviewer: Could the fact that the interviews are conducted by phone lead to a bias in Canada? In other words what is the proportion of the population with/without phone?

Author: Based on Statistics Canada, telephone interviews is a “cost-effective method that can provide access to large samples (compared with personal interview) and instant results (compared with mailed surveys).” It can also “facilitate responses to sensitive questions (e.g., about sexual behaviours) as compared with personal interviews and are less likely to lead to socially desirable answers”. Based on estimates from December 2006, 90.5% of the households reported having a land line, while 66.8 per cent reported having at least one cell phone.

Reviewer 2:

Reviewer: Title and Abstract: “prevalence of smoking during pregnancy and associated risk factors…..” might more clearly cover the content of this research.

Authors: Acknowledged. The necessary changes have been made.

Reviewer: The authors mention “bootstrapping and the complex sampling design”. The sampling design needs to be described in more detail. On what basis were the 8542 women selected and on what basis were they reduced to 8244. What selection process was used. Why did some of the people not respond, did they not answer their phone? How often were they contacted? Is anything known about their characteristics?

Authors: A total of 8,542 Canadian women were randomly selected from the 2006 Canadian Census of Population. Around 8,244 women were estimated to have met the eligibility criteria of the study. The eligibility criteria included all women aged 15 years and above, who had singleton live births between the period of February 15, 2006 and May, 2006 in the provinces of Canada and between November 1, 2005 and February 1, 2006 in the territories of Canada and who lived with their baby at the time of data collection. A total of 6,421 women, however, responded to the survey. Non-response to the survey was mainly from inability to establish contact with the mothers. In an attempt to recruit the highest number of mothers possible, a total of 25 calls per each case were made during different days of the week and different hours of the day. Moreover, the MES questionnaire was available in 15 languages. All the above information has been added to the
methods section (Page 5, Paragraph 1). Moreover, references 31 and 32 provide more detailed and comprehensive information on the methodology of the MES. Limited information is available on non-respondents. However, the population weights that was created by Statistics Canada and used in this analysis, takes into consideration the non-respondents. This information has been added to the discussion section (Page 13, Paragraph 2).

**Reviewer:** Readers might benefit from some explanation with regard to bootstrapping. Why is it use and what assumptions were necessary

**Authors:** Based on Statistics Canada: “Bootstrap method is a re-sampling method for calculating valid variance estimated for complex sampling designs and complex estimators”. More references on bootstrapping are available in the references below:
The above references have been added to the paper for the readers’ information (Page 7, Paragraph 2).

**Reviewer:** Page 6 “prevalence was estimated through population weights” needs explanation. Describe process in more detail.

**Authors:** Population weights are calculated to take into consideration non-response. Based on Statistics Canada: “the principle behind estimation in a probability sample is that each person in the sample “represents”, besides himself or herself, several other persons not in the sample. For example, in a simple random 2% sample of the population, each person in the sample represents 50 persons in the population. The weighting phase is a step which calculates, for each record, what this number is.” More information is available in reference 32, page 47. Clarifications on weighting have been added to the methods section (Page 7, Paragraph 2).

**Reviewer:** Please provide the method for the way the number of cigarettes smoked was established. (Authors might consider supplying all questions in an appendix).

**Authors:** For daily users, the question on number of cigarettes smoked was: “How many cigarettes do you smoke each day?” For occasional smokers the question was: “On the days that you do smoke, how many cigarettes do you usually smoke?” This information has been added to the methods section (Page 6, Paragraph 1). The MES questionnaire is around 90 pages long. It is available online on the following address: [http://www.statcan.gc.ca/imdb-bmdi/instrument/5019_Q1_V1-eng.pdf](http://www.statcan.gc.ca/imdb-bmdi/instrument/5019_Q1_V1-eng.pdf). In the text, the readers have been referred to it as well.

**Reviewer:** Chi square test were performed for categorical variables, what p value was considered significant? Are these results presented, if not please do so or remove statement?

**Authors:** Information on chi-square has been deleted from the methods section.
Reviewer: Stress is measured as a level based on the number of yes answers to a set of 13 questions. In the table and in the discussion stress is described as the number of stressful events. Is this the same number. Does every question asks for a specific stressful event? Please explain.

Authors: The sum of the yes answers to the 13 questions represents the number of stressful events experienced. Each of the 13 questions inquires about a specific stressful event. For more information, please refer to page 12 on the MES questionnaire: http://www.statcan.gc.ca/imdb-bmdi/instrument/5019_Q1_V1-eng.pdf. This has been further clarified in the methods section.

Reviewer: Variables to include in the multivariate analysis were selected on the basis of their significance in the univariate analysis. This forward stepwise modeling is inappropriate. For instance if prenatal care is related to smoking as suggested in other studies (reference 25 and 26) the number of prenatal visits should be included in the multivariate model even if it is not significant at the univariate analysis. (It is unclear from the test what the difference is between prenatal visits and antenatal classes reported in the table and prenatal care as mentioned in the discussion, please explain the difference).

Authors: “Prenatal visits” is defined as the number of times the pregnant women have visited a health care provider during her pregnancy. “Prenatal classes” is defined whether the mother attended prenatal or childbirth education classes during her pregnancy. The definitions have been elaborated more in the methods section. Mistakenly, prenatal care in the discussion section has been used to refer to prenatal classes. This has been corrected. The authors did not perform stepwise modeling. All the variables that proved significant at the bivariate level were considered for multivariate logistic regression. Only two variables, weight gain during pregnancy and prenatal visits, were insignificant at the bivariate level and hence were not considered in the multivariate level. Although prenatal visits have been shown to be related to smoking in the literature, in our data it is not significant. Since the study was assessing the predictors of smoking during pregnancy in the MES data, rather than looking at the association between smoking and a specific independent variable, insignificant variables at the bivariate level were not included in the multivariate model.

Reviewer: The discussion compare their findings of the study to a number of different Canadian studies. But they do not provide enough meaning to the differences they find. This article would be more interesting if such meaning is provided especially since most of the findings concur with the previous studies that are reported. A few questions that might help provide meaning are: Please explain what could be a reasons for the observed decline in smoking during pregnancy, outside differences in study design, as these reasons may be important clues on what interventions might be most effective from a public health perspective.

Authors: There is no definite answer on the reasons for the decrease of smoking among pregnant women. Speculations, however, were added on page 11, paragraph 1.
Reviewer: Is this trend of reduced smoking during pregnancy also reflected in a reduced rate in the general not pregnant population
Authors: The overall rates in the Canadian adult population have also been shown to decrease over the last few decades. Based on data from the 1960s to the 1994/1995, overall rate of smoking in Canada has declined from 45% to 31%. In another study the rate of smoking in 2003 was reported to be 21%. This information has been added to the text. (Page 11, Paragraph 1)

Reviewer: The authors conclude that preventive measures should focus on teenage girls of low economic status. But how big is this group in the total population. Will it lead to a large reduction in the 10% of women smoking. Are there alternative strategies that may be more effective. For instance only 1/3 of women are attending antenatal classes. If this attendance is improved may that lead to a reduction of smoking?
Authors: A point well taken. This point has been added to the conclusion of the study.

Reviewer: If stress is related to smoking are there ways to reduce stress and will these be effective in reducing smoking?
Authors: Authors agree with the reviewer. This idea has also been added to the conclusion section.

Reviewer: If smoking during pregnancy in the northern territories is 40% should efforts not better be directed towards this province. And what is the reason for this large proportion that is found in this and other studies.
Authors: Interventions targeting northern territories has been stressed in the conclusion of the study. Possible speculations for these high rates have been added to the discussion on page 11, paragraph 2.

Reviewer: The discussion would benefit from more precise advice on how to use the findings in this study to further reduce smoking during pregnancy.
Authors: Acknowledged. Advices based on the findings of the present study have been all summarized in the conclusion section.

Reviewer: Conclusion page 14: The conclusion that smoking rate has dropped is not supported by the data. The authors themselves point out that the differences in smoking rates can also be derived from differences in study design etc. They can only conclude that their rate is lower as compared to previous reports.
Author: A point well taken. The sentence has been rephrased.

Reviewer: The data presented in both the results and the quoted literature do not discuss smoking prevention programs and integrated health promotion strategies as effective tools to further reduce smoking in pregnancy. Please base your conclusion on the results and the conclusion.
Author: Acknowledged. The whole conclusion has been revised.
Reviewer: On page 12 a p-value is supplied with the statement that smokers were more likely to quit if they were not living with smokers. Does this mean that the other percentages mentioned in the discussion or not significant. Or is it very unusual to find this p-value. Please explain and provide us with the actual numbers if the p-value is to be maintained in the text.

Author: The p-value reported on page 12 refers to a study from the literature and not to the findings of the present study. The sentence in the text has been restated to clarify this point.

Reviewer: Page 13 “the study rates are suggested to be underestimated”. Suggested by whom. Please explain.

Author: Based on the referenced studies [14,15,24], the rate of smoking during the last trimesters of pregnancy are lower than the rates of smoking during the first months of pregnancy. Therefore, since the present study only looked at smoking during the third trimester of pregnancy, the authors believe that the rates reported in this study are lower than the ever smoking rates during all the months of pregnancy. The word “underestimate” might have been inappropriately used. Further clarifications have been made in the text.

Reviewer: Can you provide an estimation about the size of the underestimation due to the bias introduced by self reporting of sensitive variables.

Author: Unfortunately it is very difficult to quantify the bias introduced by self reporting of sensitive variables as no biomarkers were used to validate the answers.

Reviewer: Authors start with a general statement of smoking being worldwide the most important preventable risk factor. They do supply a reference with this statement but judging from the title this article deals with smoking behaviour in Japanese women. Is their general statement based on this study or do the quote Maeno quoting somebody else. If so please provide us with the original source of this important first statement.

Authors: The first sentence has been removed from the text since more detailed references are provided in subsequent sentences.

Reviewer: Abstract: The authors choose to report OR only for attending prenatal class and experiencing stressful events, please remove OR from abstract or provide OR for all outcomes. For the stressful event OR see my comment before, secondly different numbers are used both in abstract and results.

Authors: Acknowledged. All the OR were removed from the abstract.