Reviewer's report

**Title:** Influenza vaccination coverage rates among adults before and after the 2009 influenza pandemic and the reasons for non-vaccination in Beijing, China: a cross-sectional study

**Version:** 2  **Date:** 20 July 2012

**Reviewer:** Catherine Wetmore

- Major Compulsory Revisions

1. The authors did not address one of my primary concerns about the analysis of these survey data. Specifically, in point #11 of my initial review, I asked the authors to comment on the extent to which their analysis accounted for their complex sampling design. It does not appear that communities were selected with probability proportional to population size, so I don’t think it is appropriate to simply calculate the proportion of survey responders who received the flu vaccine at each time point in unweighted analyses, since responders do not represent a simple random sample of the underlying population. I ask that the authors please confirm that they have accounted for the unequal selection probabilities of survey participants and that they provide this detail in the methods section of the paper. Without better information about the relationship between the sample and the population, we can not extrapolate from their sample data to make statements about the population of adults in Beijing. The authors should also provide some explanation of the method they used to select 3 urban districts and 3 suburban districts from which to draw their sample.

2. The authors also failed to address comment #2 in my initial review concerning their extremely high response rate (97.9%). It would be interesting to know about the strategies they employed to achieve such a high response rate. Was response compulsory? Was participation incentivized? How many return visits were made? Were return visits made to homes when all residents were absent at the time of the initial visit? Or were those homes simply skipped?

3. Urban/suburban residence is one of the few demographic characteristics that the authors examined in this study, but they have not provided any information on how this designation was defined and assigned. This should be added to the methods section. Additionally, I don’t think it is appropriate to refer to this characteristic as “region” throughout the text. The term region is very imprecise in
this context. It might be better to refer to density or simply urban vs. suburban residence.

4. Results / Description of the Sample: The authors should indicate whether or not their sample is representative of the adult population of Beijing, and they should provide an appropriate reference to back up this statement. Since they have extrapolated results from their sample to the entire adult population of Beijing (in what appear to be completely unweighted analyses), it seems that they are making this assumption. They should be explicit about it.

5. Discussion: Please comment on the notable increase in vaccination coverage during the 2009/2010 season.

- Minor Essential Revisions

6. Overall, the abstract seems long and doesn’t describe a very compelling narrative. In addition, the authors have not included any of their statistical methods in the methods section of the abstract. I suggest that the authors work to distill their abstract to the most compelling findings from their work, while at the same time, providing readers with enough information to understand the process by which these results were generated.

7. In the first submission, the authors described their multistage sampling approach as selecting towns/streets from each district, and then selecting communities from each town/street. In the revision, the authors simply refer to “locations” and “sub-locations”. The use of “locations” and “sub-locations” is not very informative, and I’d suggest reverting to the language used in the initial submission (or something similar).

8. In the first submission, the authors indicated that 82 participants were selected from each sub-location; in the revised submission, the authors indicated that 87 participants were selected from each sub-location. No explanation was provided for this change. Can the authors please confirm the correct number?

9. Methods / Statistical Analysis section: The authors indicated that for their multivariable models they considered for inclusion all factors significant at p<0.2 in univariate analyses. They also indicated that they used a forward stepwise approach with p<0.05 required for entry. In effect, doesn’t this mean that they only considered for inclusion in the multivariable models those factors that were significant at the p<0.05 level in univariate comparisons? Please confirm and revise as necessary.

10. Results / Description of the Sample: The authors note that approximately half of their sample lived in urban areas. They should explicitly note that this is by design. The authors stated in the methods section that they selected (by some unknown means) 3 urban districts and 3 suburban districts from which to draw equal-sized samples.

11. Results / Demographic Variables Affecting Influenza Vaccination Uptake: This section would be greatly improved by reorganizing and condensing the three paragraphs into one paragraph. The first sentence in each of the existing paragraphs is extraneous and should be deleted. The last sentence in paragraph 1 should be re-written: “Across the three seasons, we observed significant
differences in vaccine coverage by age and also by educational attainment” (or something similar). The second sentence in paragraph 2 should be re-written: “Vaccination frequency was not significantly associated with gender or residence in urban or suburban communities” (or something similar). Paragraph 3 can be replaced entirely by weaving the following statement into paragraph 1 of this section: “Older age and educational attainment were independently associated with increased odds of reporting vaccination in season 2009/2010 and 2010/2011 (Table 3).”

12. Results / Reasons for Non-Vaccination: The first sentence of this paragraph is extraneous and should be deleted. The second sentence should be revised as follows: “Among participants who reported no influenza vaccinations over the previous three seasons, the most commonly reported reason for non-vaccination was ‘I don’t think I am very likely to catch the flu’ (49.0%) (Table 4).

13. Discussion: The following sentence seems misplaced: “The elderly felt more at risk than younger people in our study, which may be one of the reasons for higher coverage rate among the elderly.” It should be moved to the next paragraph, and revised to “In our study, elderly participants also felt more susceptible to influenza than younger participants, which may be another reasons for higher coverage among older adults.”

14. Discussion: The following sentences are included in the discussion: “People with low education level are less likely to be exposed to the information [13], which might have negative effect on the vaccination coverage rates. Furthermore, to our knowledge, the elderly are usually not well-educated in Beijing. This may cause quite a few of low-educated people receiving the free vaccination when the free vaccination policy for the elderly was carried out.” There are several issues this these statements. First, I don’t think it is appropriate to state “to our knowledge, the elderly are usually not well-educated in Beijing”. If this is a real phenomenon, the authors should be able to provide a reference for this statement. If they can’t find a reference, this statement is speculation, and perhaps should be re-worded. Second, the results of the authors’ multivariable analysis indicate that old age and low education were INDEPENDENTLY associated with higher odds of vaccination. That means that regardless of age, lower educated adults were more likely to report getting vaccinated. Is this because of the response bias (since illiterate participants did not have the opportunity to submit anonymous survey responses)? Possibly. It maybe also be due to some real, underlying phenomenon, and the authors should comment on this possibility. Third, if the authors choose to retain the excerpted sentences, they will need to be revised substantially for clarity and quality.

15. Discussion: The following sentence should be revised from “Secondly, the different reasons could not be given for each influenza season as the reason for non-vaccination may be different at different times.” to “Secondly, reasons for non-vaccination may differ from season-to-season, but respondents were not able to provide different reasons for each season on the survey” (or something similar).

- Discretionary Revisions
- Minor Issues Not for Publication

16. Review of this revision would have been facilitated by the inclusion of a “tracked-changes” version of the revised manuscript. Please include a “tracked-changes” version with all subsequent resubmissions.

17. Numerous typographical/grammatical/editorial errors that should be addressed throughout the abstract and text of the manuscript. These issues are too numerous to list in this review. Here are a sample of suggested revisions:

   a. Throughout the manuscript, replace “consideration about susceptibility to influenza” with “perceived susceptibility to influenza”

   b. Throughout the manuscript, replace “suburb” with “suburban”

   c. Revise the final paragraph of the background section from: “The aim of this study was to show the trend of vaccination coverage rates in the general population of Beijing before and after the 2009 influenza pandemic (influenza seasons 2008/2009, 2009/2010, and 2010/2011), and identify possible demographic factors. We also tried to explore the reasons for non-vaccination.”, to: “The aim of this study was to estimate vaccination coverage rates in the general population of Beijing before and after the 2009 influenza pandemic using data from three influenza seasons: 2008/2009, 2009/2010, and 2010/2011. We also sought to explore reasons for non-vaccination.

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

**Quality of written English:** Not suitable for publication unless extensively edited

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

**Declaration of competing interests:**

I declare that I have no competing interests.