Author's response to reviews

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

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Version: 6 Date: 9 November 2012

Author's response to reviews: see over
Dear Editors and Reviewers:

My manuscript, ‘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’, was revised according to the reviewers' comments, and the itemized response to each reviewer’s comments is attached. Many thanks for your suggestion. I am so sorry to bring you so much trouble because of our carelessness. Thanks very much again for your attention to our paper. Once again, thank you for your help to our paper’s processing.

Sincerely yours,
Shuangsheng Wu

For your guidance, a point-to-point response to the reviews’ comments is appended below.
Dear Dr. Wetmore:

1. I thank the authors for revising their analysis strategy in order to account for the age and sex distribution of respondents. I think this approach strengthens the overall contribution of their study and improves the extent to which their estimates of reported uptake of vaccinations can be extrapolated to all adults in Beijing. It might also be important to account for urban/suburban place of residence, unless Beijing as a whole is split about evenly across these categories. Can the authors please comment on this?

   According to your suggestion, we calculated the rates and frequency accounting for urban/suburban place of residence in this revision. Changed results were represented in the manuscript.

2. I am assuming that the authors developed sample weights for each respondent using the known age and sex distribution of the Beijing population based on census estimates, but the authors have not explicitly described their approach. Please add this information so readers will be better able to understand the methodology.

   To calculate the total coverage rates and vaccination frequency, we partitioned the population and vaccinated people into 20 strata (5 age groups, rural and suburban areas, and both genders) using the Census of Beijing 2010 population. Weighted analysis was also conducted to calculate the age, sex and residence-specific rates and frequency, accounting for the age, sex and urban/suburban distribution of the Beijing population.

3. I am curious why only some of your results changed after incorporating weights into your analysis. For example, in Table 1, only the results in the “Total” row changed, but none of the other results changed. Using weights to account for the age and sex distribution of your sample should have impacted (at least minimally) all of the results in all 4 of your tables (and also possibly results that are only included in the text).

   In the last version, weighted analysis was only conducted to calculate the total coverage rates and vaccination frequency. According to your suggestion, the other results in all four tables were changed after using weighted analysis in this version.

4. The authors should include the threshold population density value that they used to classify all regions as either urban or suburban during sample selection.

   We added “The population density was more than 6548 in the urban districts and no more than 1305.4 in the suburban districts.” in sample selection.

   The population density of the 16 districts was listed as follows.

<table>
<thead>
<tr>
<th>District name</th>
<th>area(km²)</th>
<th>population(10⁴)</th>
<th>population density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dongcheng</td>
<td>41.84</td>
<td>91.9</td>
<td>21964.6</td>
</tr>
<tr>
<td>Xicheng</td>
<td>31.66</td>
<td>124.3</td>
<td>39260.9</td>
</tr>
<tr>
<td>Haidian</td>
<td>430.8</td>
<td>328.1</td>
<td>7616.1</td>
</tr>
<tr>
<td>Chaoyang</td>
<td>470.8</td>
<td>308.3</td>
<td>6548.4</td>
</tr>
</tbody>
</table>
5. Did the questionnaire really include a question about population density (as noted in the methods sections of the abstract and main text of the manuscript)? Did the questionnaire simply ask respondents to self-report if they believed they lived in an urban or rural area? Did it collect the address of the residence which was then classified by the authors as urban/rural based on population density estimates? If address was collected, how was anonymity maintained? Please revise the abstract and text as needed in order to address these uncertainties. The questionnaire included the information of residential district. The respondents were classified as urban/suburban according to the district where the participants were recruited.

6. The description of the model-building approach is still unclear and should be rewritten. The authors state in the manuscript that “all variables significant at p value <0.2 in the univariate analysis were included in the multivariate model”. This suggests that a full model was built. The authors then write that they used a “forward stepwise method with p value <0.05 for entry and p value ≥ 0.10 for removal”. The actual approach that they used may have been perfectly adequate, I am simply asking them to rewrite this section to eliminate the internal inconsistencies in the way they described their approach.

The description of the model-building approach was revised as follows: “Possible determinants of influenza vaccination uptake were investigated by multivariate logistic regression. Gender, age, educational level, population density were included as independent variables. The multivariate model was conducted using a forward stepwise (Wald Chi-square) method with p value <0.05 for entry and p value ≥ 0.10 for removal.”

- Minor Essential Revisions

7. In the section titled “Reasons for non-vaccination”, the authors present a series of 4 comparisons between younger and older respondents. The authors state that there were differences between the age groups with respect to each of these characteristics. Can they please include the p-values for these comparisons? For example: “(50.2% vs.
42.2%; p=0.0XX”).
We added the p-values for these comparisons in the section of “reasons for non-vaccination”.

8. The 5th and 6th sentences in the 4th paragraph of the discussion section should be rewritten for clarity. “Furthermore, we found that the elderly reported lower levels of education than younger people in our study. Thus, the free vaccination policies for elderly adults may have also contributed to the higher vaccine coverage among adults with lower education that we observed in our study.” (or something similar)
The sentences were revised according to your suggestion.

9. The 2nd table should be labeled “Table 2” and the 4th table should be labeled “Table 4”.
The two tables were labeled “Table 2” and “Table 4”.

In addition, some corrections and editing have been done by us according to your suggestions.
Finally, thank you for your arduous work and instructive advice.
Dear Dr. Bish

Some corrections and editing have been done by us according to your suggestions. Thank you for your arduous work and instructive advice.