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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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. Thanks very much again for your attention to our paper.
Sincerely yours,
Shuangsheng Wu

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

- Major Compulsory Revisions

1. In the methods section of the manuscript, the authors should describe how they selected ~87 participants from each community. How/where did the surveys take place? Did the interviewers visit households and did they complete household rosters in order to randomly-select one eligible adult from within the household? Or did they simply ask for volunteers within the household? Did they find convenience samples of 87 community residents? If so, from where were these convenience samples drawn? Did participants need to be residents of the districts>towns>communities from which they were drawn, or did they simply need to be physically present in the community at the time of the study?

   All the households were numbered according to the address numbers, and then some of them, approximately 29 to 43 households, were randomly selected for interview in each community. The interviewers visited these households one by one, and interviewed each adult within these households until 87 residents were investigated in each community.

2. The authors have clearly stated that for the 2009/2010 season, they included both seasonal influenza vaccination as well as H1N1 influenza vaccination in their calculation of vaccine coverage. The authors should state their rationale for doing this. Did they think that respondents would not be able to differentiate between the type of vaccine that they received that year or was there some other reason? Furthermore, the authors state that there were two separate campaigns that year (one for seasonal vaccine, and one for H1N1 vaccine) – nonetheless, the authors repeatedly state that the increased vaccine coverage was “not sustained” the following season. The authors should provide some justification as to why they would have expected the increases in vaccination coverage to have been sustained in the following year. Without this justification, it seems like a simple issue of comparing “apples” to “apples+oranges”.

   As we know, it would be difficult for the respondents to differentiate between the types of vaccine that they received, so we included both seasonal influenza vaccination as well as H1N1 influenza vaccination in the calculation of vaccine coverage.

In the background section, we stated that 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. We hypothesized that residents’ perceptions of influenza were expected to be improved after the influenza pandemic. Because many studies have found that perceptions of influenza affected the uptake of vaccines, there may be some changes of vaccine coverage before and after the pandemic. In other words, we supposed that the vaccine coverage rates were not only increased during the pandemic (season 2009/2010), but also after the pandemic (season 2010/2011). For this reason, there was a comparison of vaccine coverage between season 2008/2009 and 2010/2011 in our study, but no significant was found. So we stated that the increase vaccine coverage was not sustained in the following season.
3. Throughout the abstract and manuscript, the authors’ interpretation of their primary result is that “the significantly increased uptake of vaccination during the pandemic was not sustained in season 2010/2011.” An alternative interpretation could be that the overall vaccination coverage increased but then declined significantly between 2009/2010 and 2010/2011 (the authors would need to verify/confirm the significance of this decline). Furthermore, a closer examination of their subgroup analyses suggests that this potentially significant decline was not observed among the elderly populations. In other words, vaccination coverage rates remained much higher in 2010/2011, as compared to 2008/2009 among adults aged 60 and older. The authors should consider emphasizing this relative “success story” among elderly populations, despite the fact that the coverage rate still fell far short of the WHO target of 75%.

In the result section, we added the comparison of vaccination coverage between 2008/2009 and 2010/2011 among the elderly as follows: “Nonetheless, the vaccination coverage rates remained higher in season 2010/2011, as compared to 2008/2009 among the elderly (χ²=28.841, p<0.001).” And we discussed this “success story”, and stated that “the policy of free vaccination may be the main reason for the increasing vaccination coverage rates in the elderly” in the discussion section.

4. The ordering of response options can greatly impact multiple-choice survey questions. Were the response options in the section on reasons for non-vaccination randomly ordered or always shown in a fixed order? Based on the description in the methods section, it appears that “I don’t think I am very likely to catch the flu” was the first response option. If this response option was among the first options listed on the survey, it is not at all surprising that this would be the most common response option. On multiple-choice survey items, respondents frequently select the first response that is applicable to them and then they move on to the next question, without reviewing the full list of response options.

The response options in the section on reasons for non-vaccination were shown in a fixed order as follows: ‘I have never considered it before’, ‘I don’t think the vaccine is effective enough’, ‘I don’t think I am very likely to catch the flu’, ‘I don’t think influenza is a serious illness’, ‘I am afraid of the side-effects’, ‘I have the specific contraindications’, ‘The influenza vaccination is too expensive’, and ‘I have no time to get vaccination’. The most common response option “I don’t think I am very likely to catch the flu” was not the first response option. In addition, most of the visits were undertaken by local health workers who had good relationships with the participants and knew how to motivate them. Therefore, our results of the reasons for non-vaccination were reliable. We have commented this in the discussion section.

5. In the discussion section, the authors state “according to our knowledge, very few people received influenza vaccination after December”. The authors should provide a citation for this statement.

In the recent years, the influenza vaccines were provided to the residents from September (or October) to November according to the rules of Beijing Health Bureau,
for example form 15 October to 30 November 2012 in season 2012/2013 [27] (http://www.bjhb.gov.cn/gzfwq/zkzt/2012lgym/jzzc_20121015/201210/t20121016_54757.htm [in Chinese]), thus it was difficult for the residents to uptake influenza vaccines after December. For this reason, very few people received influenza vaccination after December.

-Minor Essential Revisions
6. When describing the 3 sections of the questionnaire (in the abstract and methods sections of the manuscript), the authors should consider the following revision “(gender, age, educational level, and residential district name)”. The sentences were revised according to your suggestion.

7. In the background section of the manuscript, the authors refer to “consistently low coverage rates” based on surveys of 5 European countries [refs 12, 13]. The authors should provide some indication of the estimated coverage rates that were observed so the reader can better understand what is meant by “low”. Similarly, the authors mention a study in China that reported “low” vaccine coverage [ref 22]. The authors should provide an indication of the actual vaccine coverage rates that were observed, in addition to the qualitative statement that coverage rates were “low”.
   We revised these sentences as follows:
   1. Surveys from 5 European countries showed consistently low coverage rates in the general population during recent years, 25.0% in UK, 27.4% in Germany, 21.8% in Spain, 24.2% in France and 24.4% in Italy, in 2006/07 [12-13].
   2. However, low acceptance of a vaccine or uptake rates against pandemic influenza were reported in many studies, 25% among health workers in Beijing, 17.0% among French adult population, and 8.9% among pregnant women in Turkey [15-19].
   3. However, the study in 7 urban and 2 rural areas of China showed that the uptake rate of the seasonal and pandemic influenza vaccine was 7.5% and 10.8%, respectively, and few residents worried about being infected by influenza A (H1N1) (25.1%) [22].

8. In the background section of the manuscript, the authors should consider the following revision: “In Beijing, the first case of H1N1 infection was reported on May 16, 2009.”
   The sentences were revised according to your suggestion.

9. In the methods section of the manuscript, the authors should include the units for population density (e.g., “6,548 people per km2”).
   We have included the units for population density.

10. In the discussion section of the manuscript, the authors state that their results were “similar” to the low vaccination coverage rates observed in 5 European countries. In fact, vaccination coverage in Beijing was markedly lower than vaccination coverage observed in the previous studies in 5 European countries.
We revised the first paragraph in the discussion section like this, “The survey found consistently low level of influenza vaccination coverage rates in season 2008/2009, 2009/2010 and 2010/2011 in Beijing, which is lower than the results from surveys in five European countries.”

11. In the discussion section of the manuscript, the authors state that vaccination coverage among elderly adults in their study was “significantly lower” than the vaccination coverage among elderly in the previous studies conducted in 5 European countries. Did the authors perform significance testing to support this claim? If not, a synonym should be used to describe this difference which does not have any statistical implications.

We tested the significance and found that the vaccination coverage rate among the elderly in Beijing 2010/2011 was significantly lower than the results of the previous studies conducted in 5 European countries 2007/2008 (43.1% [95% CI: 44.1-48%] vs. 60.4% [95% CI: 59.4-61.4%]).

We revised the sentence as follows: “However, they were significantly lower than vaccination coverage rates in the five European countries (43.1% [95% CI: 44.1-48%] in Beijing 2010/2011 vs. 60.4% [95% CI: 59.4-61.4%]) in Europe 2007/2008 [13].”

12. In the discussion section, the authors cite previous research [ref 16] which showed that free vaccination would facilitate improvements in vaccination coverage rates. The authors should comment/discuss whether or not they think their results support (or contradict) this previous finding.

In our study, we found the elderly were more likely to be vaccinated than younger people, and the vaccination coverage increased substantially from 1.7% during 1999-2004 to 43.1% in 2010/2011 among the elderly. However, it was 3.65% during 1999-2004 and less than 15% in 2010/2011 among younger people in Beijing, and its growth rate was much slower than among the elderly. And seasonal influenza vaccines were free to the elderly but not to younger people since 2007. The fact indicated that the policy of free vaccination may be the main reason for their different growth rate. Thus we stated “These studies highlighted that easy access to free vaccination would play a key role in improving the vaccination coverage rates”.

13. In the discussion section, the authors discuss the role of “suspicion” and fear of side effects and allude that these may have been more important impediments, to vaccination for adults with higher levels of education and more access to social media. However, their survey results indicate that fear of side effects was relatively infrequently reported (<20%), and was actually more commonly reported among elderly adults (who are less likely to be well-educated or to have access to social media) than younger adults.

1. In the result section, we added the results of the reasons for non-vaccination by educational level.
2. Furthermore, we re-discussed the possible reasons for higher coverage rates among illiterate people in the 4th paragraph of the discussion section.
14. In the tables, the column headers should be titled “Weighted %” rather than “%”, if the authors did in fact conduct a weighted analysis.
We have replaced “Weighted %” with “%” in these tables.

15. In Table 2, there is a clear bi-modal distribution of vaccination frequency among illiterate respondents (either 0 or 3). The authors should comment on this striking finding.
In our study, the vaccination coverage rate among illiterate people was higher than well-educated people. And some studies found vaccinated people were more likely to accept vaccination in the following years*. Therefore there were more illiterate people who insisted on accepting vaccinations in all the three seasons than well-educated people. In addition, compared to well-educated people, illiterate people were less likely to report “I don’t think I am very likely to catch the flu”, which was the predominant barrier. Thus it was easy for them to insist on accepting vaccinations. For the above reasons, there is a bi-modal distribution of vaccination frequency among illiterate respondents.
*Chor JSY, et al. Willingness of Hong Kong healthcare workers to accept pre-pandemic influenza vaccination at different WHO alert levels: two questionnaire surveys

Finally, thank you for your arduous work and instructive advice.