Reviewer's report

Title: Influenza vaccination coverage rates of adults before and after 2009 influenza pandemic in Beijing, China: a cross-sectional study

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Reviewer: Alison Bish

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Influenza vaccination coverage rates of adults before and after 2009 influenza pandemic in Beijing, China: a cross-sectional study

Major compulsory revisions

1. The title is not very informative as it does not mention that demographic factors and reasons for non-vaccination are also examined. Could the authors reword it?

2. In the conclusion the authors refer to the introduction of the policy of free vaccination and is the paper actually about changes pre/post that rather than pre/post pandemic? Perhaps the authors could comment.

3. The fact that the authors examine uptake of vaccination before and after the 2009 pandemic implies that they expect there to be some influence on the pandemic on uptake rates. However, they do not elaborate on this in their paper and should do so.

4. The paper does not state whether participants were asked whether they had been offered vaccination and therefore the respondents to the questionnaire are possibly not those people who had even been offered vaccination. However, vaccination being unavailable is not provided as a response option for non-vaccination. In addition, the authors should also comment on the fact that the priority groups for vaccination are different in the different seasons.

5. Background: This section does not show a good knowledge of the existing literature in the area. In addition, the authors do not distinguish between studies of seasonal and of pandemic vaccination uptake.

6. Participants – paragraph 2 on page 4 is very unclear. It implies that a sample size of 12,294 was reduced to 82 which is clearly not the case. This paragraph should be re-written.

7. Data collection – how did the authors select the options for reasons for non-vaccination? Was this based on a search of existing literature? It is a weakness that different reasons could not be given for each influenza season as the reason for non-vaccination may have been different at different times.

8. Data collection. The authors should comment on the different method of data
collection for those who could not read the questionnaire. The interviewer administered questionnaire could have lead to response bias with a social pressure in the face of the interviewer to report uptake of vaccination, and this might explain the reported higher uptake amongst illiterate people.

9. Statistical analysis. Because the authors only asked about reasons for non-vaccination, rather than attitudes to vaccination amongst all respondents, it is impossible to discern if, say uptake is actually affected by a feeling of not being at personal risk; maybe those who were vaccinated also didn’t feel at much risk but were vaccinated anyway for some other reason. This weakens the paper as a whole and is a limitation. Could the authors comment?

10. Results/Description of sample. In the methods the authors give a figure of 12,294 and here they give figure of 13,287. Please clarify. Also the response rate should be given after the figure of 13,002.

11. Results/influenza vaccination coverage rates. Please address the following:
   (a) This section should just be about vaccination coverage rates but instead includes demographic results too.
   (b) The authors show a statistically significant increased rate of vaccination coverage in season 2009/2010 but later in the discussion they state that there is no significant difference. Which is correct?
   (c) The authors state no gender difference but this is not in keeping with other work (e.g. Bish A, Yardley L, Nicoll A, Michie S (2011). Factors associated with uptake of vaccination against pandemic influenza: A systematic review. Vaccine. doi:10.1016/j.vaccine.2011.06.107), would they care to comment?
   (d) The authors should specify what difference was noted in season 2008/2009 with respect to regional variation.
   (e) Please clarify the ‘similar trends’ in the ‘elderly and illiterate respondents’. What trends are they referring to? Similar to what?

12. Results/Demographic variables affecting influenza vaccination uptake. This section repeats the results in the previous section. In fact the results would be better here and should therefore be removed from the previous section.

13. Results/Reasons for non-vaccination. In fact table 4 shows differences in reasons by age. Why are these results not reported in the text?

14. Discussion. Please address the following:
   (a) As mentioned previously, the authors state here that the 2009 pandemic had no impact on coverage, but in the results they state that there was a difference. Which is it?
   (b) The authors refer to studies suggesting that perception of risk severity was a major cause of low uptake of vaccination. Do the authors mean the chances of catching pandemic flu or do they mean how serious it would be if you did catch it? I suspect they mean the former (and certainly the literature on uptake of pandemic flu states this – see Bish et al 2011).
(c) The recommendation that public health messages should increase the view of the danger of influenza does not logically follow from their data. The respondents have endorsed the option that they ‘don’t think they will catch it’ not that they don’t think it is serious. Later in the discussion (pages 7-8) the authors go beyond their data in specifying what should be included in an educational campaign. The authors state that reducing the financial burden would be effective but in fact they assessed whether cost was a barrier and this option was not endorsed by many respondents. They state that the reasons for uptake in the elderly was because vaccination is free but they did not in fact assess this, perhaps elderly people feel more at risk, indeed table 4 would suggest that they do.

(d) The paragraph in the discussion about the influence of education and age on uptake (page 7) is somewhat muddled and should be rewritten. References are needed for the assertion that higher educational level is associated with vaccination uptake and that the elderly are not usually well educated.

(e) The authors should specify which studies they are referring to when they state that ‘unlike former studies in western countries our survey showed that not expecting to catch influenza...’ Indeed I suspect that they actually mean ‘Like former studies’, not ‘unlike’.

(f) Final paragraph on page 7. The authors should specify which other groups with low coverage they mean. Is there evidence that only the elderly have been considered in the past?

(g) Limitations – perhaps the authors could comment on the wider applicability of their study beyond Beijing?

15. Conclusion

(a) The authors introduce the aim of assessing vaccination coverage rates following the policy of free influenza vaccination, when this has not been raised earlier in the paper/introduction.

(b) The final sentence of the conclusion goes beyond the data, i.e. ‘delivering information about risk severity, side effects and vaccine efficacy to the public’ does not follow from the study findings.

Minor essential revisions

1. Abstract. The following changes should be made to the abstract

(a) Background: 2nd sentence change ‘generation’ to ‘general’ and ‘needed to understand’ to ‘need to be understood’.

(b) Methods: clarify if reasons for non-vaccination were assessed for each season’s vaccination period.

(c) Results: Why are only age and educational level discussed, what about the gender and region results?

(d) Conclusions: 1st sentence, insert word ‘the’ after ‘In’. Change ‘before and after’ to ‘following’.

2. Background. Please make the following changes
1st sentence. Either write ‘the elderly’ or ‘elderly patients’ but not ‘the elderly patients’.

Delete the letter ‘s’ from the word millions in second sentence.

2nd paragraph, 2nd sentence add an ‘s’ to the word ‘population’.

2nd paragraph- Give references for the sentence ‘fear of side effects and doubts about vaccine efficacy were suggested as major reasons for non-vaccination’.

2nd paragraph 5th sentence - delete word ‘The’ at beginning. Insert word ‘the’ before ‘general’.

Final paragraph – insert word ‘the’ before ‘general’ and before ‘2009’.

Final paragraph – are ‘possible influencing factors’ and ‘reasons for non-vaccination’ the same thing? If so delete on or the other.

Please clarify if the 2009 vaccination programme was offered to everyone in Beijing.

3. Participants - change the words ‘the sample size’ to ‘a sample size’ in final sentence of paragraph 1.

4. Data collection – the phrase ‘defined as from July to June in next year’ does not make sense and should be rewritten.

5. Statistical analysis. Please address the following

(a) Change ‘The main outcomes were vaccination coverage rates’ to ‘the main outcome was vaccination coverage rate’.

(b) ‘Since influenza outbreak and pandemic influenza vaccination campaign was also conducted in 2009’ is not clear and should be rewritten.

(c) Final sentence – change ‘carried in’ to ‘carried out’

6. Results/influenza vaccination coverage rates.

(a) Insert the word ‘a’ before significant difference in the 4th and 5th sentences.

(b) 6th sentence – change ‘significant’ to ‘significantly’.

(c) Put the sentence beginning ‘10.7% of the respondents...’ at the beginning of this section and change word ‘season’ to ‘seasons’.

7. Discussion

(a) The sentence ‘Not surprisingly high influenza vaccination coverage rates were observed in the elderly’ is not consistent with the first sentence of the discussion which states that the survey found ‘consistently low levels of influenza vaccination coverage rates’. Please reword.

(b) Reword the sentence ‘The elderly was recommended as priority population’

(c) Insert word ‘financial’ before ‘cost’ in the sentence ‘A study in Hong Kong had found the uptake of vaccination against influenza would be sensitive to personal cost’.
(d) Give a reference for the assertion that higher educational level is associated with vaccination uptake.

(e) Change word ‘get’ to ‘understand’ in the sentence ‘The underlying assumption is that well educated people....’

(f) Top of page 8 delete the duplicated sentence which begins ‘In this study not expecting ....’

(g) The sentence ‘Secondly the elderly, healthcare workers.....rates were only reported in the elderly’ does not make sense and should be rewritten.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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