Reviewer’s report

Title: Characterizing Influenza surveillance systems performance: Application of a Bayesian hierarchical statistical model to Hong Kong surveillance data

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Reviewer: Wim van der Hoek

Reviewer’s report:

This paper has several strong aspects, especially the use of many different surveillance systems and data sources; and the availability of serological data (for the pandemic period only), providing estimates of incidence of infection. Unfortunately, it is also a rather intimidatingly long article, which is difficult to read for public health practitioners with limited knowledge of modelling approaches.

Major Compulsory Revisions

Abstract
1. The methods section in the abstract provides no information other than that surveillance systems were “identified”. This is in contrast with the very long methods section in the main article.

Background
2. The background section is too long and a clear and concise (one-sentence) objective or research question is missing.

Methods
3. The methods section is very comprehensive consisting of some 10 pages with a large number of tables and figures. Of course, statistical / modelling experts should have the possibility to check the various data sources, modelling assumptions and parameters but I wonder whether this section could not be shortened considerably.

Discussion
4. It would be good if the authors could start the discussion with a short para saying what their most important finding is.
5. A large number of references have been used in the background and methods section. In contrast, there are hardly any literature references in the discussion section, while a key role of the discussion would be to place the findings in the light of past work.

Conclusion
6. The conclusion section is easy to read, except that more than two pages seem excessively long for concluding remarks.
Minor Essential Revisions

Abstract
1. Abbreviations (ILI) should not be used in the abstract, unless explained. The terms %ILI-visit and laboratory

Background
2. Page 4: I assume that the authors refer to the US CDC. If so, please specify.
3. Page 4: It is true that internet-based surveillance systems can provide important supplementary data, but they are certainly not “the baseline standard”.

Methods
4. Page 8: “sentinel surveillance monitoring” is not a good term
5. Page 8: use the standard, internationally accepted terminology of “Influenza A(H1N1)pdm09 virus infection” rather than “pH1N1”, at least the first time.

Results
6. Figure 1 is not very informative and could be left out
7. While “completeness” or under ascertainment with underreporting are often used in surveillance systems, the term “excess” is not so common and that authors should explain this term in plain text, not only with formulas.
8. I would suggest that the authors put some effort in minimizing the use of abbreviations and acronyms.

Discussion
9. The discussion section could have been kept free from unintelligible abbreviations / acronyms such as “GP”, “RHE”, and “P&I-HA(0-15yr)”.
10. Page 25: I do not understand the statement “The more specific the case definition is, the more likely it is influenced by the information environment”. Is it not just the other way around?

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

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

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests’