Reviewer's report

Title: Age distribution of influenza morbidity and mortality: a comparative analysis between seasonal influenza epidemics and the H1N1 pandemic.

Version: 1 Date: 4 March 2010

Reviewer: Anne A Mazick

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Major Compulsory Revisions

Background:
1) The background is very brief, is lacking a sufficient introduction into the subject as well as a clear statement of the aim and the objective of the manuscript.

Remark: The assessment of age specific morbidity in pandemic compared with seasonal influenza epidemics is subject of many surveillance reports and publications of the pandemics epidemiological characteristics.

Methods:
2) Definitions of seasonal influenza epidemic periods and the 2009 H1N1 pandemic period are lacking.

3) Seasonal epidemic data:
3.1) No selection criteria for influenza epidemics included in the study were given, it was only stated that “typical” epidemics were selected. This is not adequate and the reader is left wondering what a “typical” epidemic consists of.

3.2) The seasonal epidemics chosen to compare to the H1N1 pandemic in 2009 date back between 20 and 30 years. Therefore the populations compared in this study may have different underlying levels of immunity to influenza viruses as well as the systems to collect morbidity data may be very different. Both factors may limit the comparability of the data here presented.

3.3) Apart from the US which was included in both the seasonal and epidemic analysis, different countries were used for the comparison (France and US for seasonal data; New Zealand, Mexico and Us for pandemic data.) No explanation was given why these countries were chosen nor was described how comparing data from different countries may influence the results.

4) Morbidity data
4.1) A description about the nature of the pandemic morbidity data (and also mortality data) is lacking. Where they clinical illness or laboratory confirmed influenza? How were these data collected and where the morbidity data of the seasonal influenza collected in a similar and comparable manner?

4.2) For the morbidity data during seasonal epidemics: It is not clear what “ILI
was confirmed virologically” means: Laboratory confirmed influenza?

5) Population data and all-cause mortality data.
5.1) No reference to the used population data and all-cause mortality data is given for the seasonal epidemics.
5.2) For the pandemic, 5 year old population data and all-cause mortality data were used. These data may change significantly over the period of 5 years especially if stratified into small age groups, leading potentially to an erroneous denominator for the analysis of pandemic data. To limit that, if data from 2009 were not available, why were not data from 2008 used?

6) Indexes used
Relative illness rate and relative mortality rate
I am not familiar with these indices and have not seen them in the published literature. It is essential to add an explanation of the indices and their interpretation /limitations, as well as why there where chosen instead of more commonly used indicators.

Results
7) Only the indices are presented, no underlying crude morbidity or mortality data or other indicators. Confidence intervals for all RIR and RMR would help to identify significant differences between epidemics and pandemic. It may be possible to add them to the graphs.

Given the uncertainties about the methodology the results section will need to be reviewed again at a more advanced stage of the manuscript.

Discussion
8) How do the results fit in with the epidemiological characteristics of the H1N1 pandemic published elsewhere?
9) The authors consider incidence data for the H1N1 pandemic are unreliable, but fail to explain why and why they think flu-like illness data are more accurate.
10) Although the authors assume that there is no age-related reporting bias, there will certainly be some. Interesting to discuss would also be if this bias differs between seasonal and pandemic influenza.

- Minor Essential Revisions

11) The titles of the figures are missing

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

Quality of written English: Acceptable

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