Reviewer's report

Title: Calculating the potential for within-flight transmission of influenza A (H1N1)

Version: 1 Date: 27 October 2009

Reviewer: Kathryn Glass

Reviewer's report:

This paper addresses an important question concerning the spread of influenza H1N1 that is of considerable interest to policy-makers. The methods used are appropriate and the mathematical details are clearly described. The only weakness of the paper is that there are, as yet, few published data to parameterize disease transmission rates, so it is difficult to validate the results on the expected numbers of cases. Nevertheless, the results concerning the differences between economy and first class travel, the impact of travel duration, and the extent of dispersion to other cabins seem likely to be robust to the uncertainty in the rate of disease dispersion, and provide valuable information about in-flight spread.

Major Compulsory Revisions

1) The authors predict that a single individual travelling economy class would infect around 5-10 individuals on an 11 hour flight. This result seems high to me, based on the relatively low value of the reproduction number for H1N1, and - as yet - few instances of clusters of cases resulting from long-haul flights (indeed, the follow-up from Han, Zhu et al Emerg. Infect. Dis. 15(10):1578-1581 suggests limited in-flight transmission of H1N1). I realise that it is not appropriate to express the infectivity parameter (q) in terms of reproduction number, as R is rarely calculated for in-flight transmission, but some discussion of the data available to estimate q would be helpful. How confident are the authors that the interval they have chosen for q contains the true value?

2) If the true value of q is lower than the values considered here, do the qualitative results concerning transmission to other cabins and the impact of flight duration change?

Discretionary Revisions

3) The mathematical details of the model are well described, but a fuller (word) description of the underlying assumptions would benefit a layperson. For example, although the model is compartmentalized by cabin, spatial dispersion of infection throughout the cabin is not modelled, so that all individuals in a cabin have an equal risk of infection. This is not clear from the description of the methods in the abstract: 'flow and dispersion of infectious droplets' suggested a full spatial model to me on my first reading.

Which journal?: Appropriate or potentially appropriate for BMC Medicine: an
article of importance in its field

**What next?:** Accept for publication in BMC Medicine after discretionary revisions

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**
I declare that I have no competing interests.