Reviewer's report

Title: Early detection of viral influenza activity in the community by monitoring clinical diagnoses of influenza in hospital emergency departments

Version: 1 Date: 16 March 2007

Reviewer: John Brownstein

Reviewer's report:

General

This study reports on an evaluation of ED-based syndromic surveillance for early detection of influenza epidemics. This is an interesting and well-written paper with use of a novel statistical approach to answer a question of public health importance.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1) What is the true value of a 3 day lead time in surveillance? The authors need to justify the public health relevance of such a lead time. During normal epidemic periods, how would interventions change with this slightly earlier warning? In a pandemic crisis, what value would three days provide? I think there may be some clear benefits but the authors should be more explicit here. While the authors discuss the additional reporting delays, they also acknowledge that these will be reduced through changes in reporting structure. The public health importance of the findings needs to be clearly addressed in the discussion.

2) One important oversight is that the authors claim originality in their analysis of ED data against a continuously collected laboratory standard. Consequently, there have been several studies that have used lab-based data for evaluation of syndromic surveillance. These include:
   These references should be cited and the authors should clearly define what advance this analysis provides (i.e. analysis of temporal relationships, timeliness,). The use of daily analysis is fairly novel yet the public health value of daily measures is not clear unless in a pandemic period (see above). Clearly, additional analysis will strengthen support for syndromic surveillance of influenza-like illness but the authors should provide better justification of the paper's scientific contribution.

3) How have the authors dealt with the co-circulation of other respiratory viruses (including RSV)? Because other respiratory illness epidemics may peak earlier than influenza epidemics this may bias the analysis toward earlier signaling of ED data.

4) The statistical framework for evaluating ED data is novel and interesting. However, validation of this method would be nice. For instance, the authors should consider looking at peaking of the raw time series data as an additional measure of epidemic timing. The is a relatively simple yet reliable validation approach.

5) The correlations reported by the authors do not appear very convincing. The authors state that these are statistically significant positive correlations but P-values should be provided.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)

1) How did the authors select ICD9 code 487 for classification? There is a broader range of codes have been used in the past and may be appropriate (See Mardsen-Haug, 2007)
2) The authors should provide more detail about the source of the laboratory data. Is this the same source of patients as the ED data?

3) We appreciate the author’s citation of our previous work in ED surveillance of influenza (AJE 2005). We would just like to point out while the Serfling regression is a method for estimating relative impact of influenza epidemics (not timing) by removing the seasonality during non-influenza periods, the Fourier transformation applied in the AJE paper explicitly incorporated the influenza epidemics to estimate timing. The authors should take a look at a number of recent studies analyzing mortality data using similar spectral decomposition methods based on the annual series (e.g.: Viboud et al. 2006. Science) for defining the timing of influenza epidemics.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

**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