Reviewer’s report

Title: Syndromic surveillance for influenza. A comparison with notification data before and during a pandemic

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Reviewer: Wendy Chapman

Reviewer’s report:

This is an extremely well-written manuscript addressing an important problem in syndromic surveillance that has not been quantified before: are patient codes the same within and outside of an outbreak period. The authors show that the ICD-10 codes in their hospitals change during the influenza season, which suggests that the ability of syndromic surveillance to detect outbreaks early may be impeded, because case diagnosis is influenced by what ED staff believes to be occurring in the community.

The findings from the paper could also be relevant to chief complaint classification of patients into syndromes. This could be worth mentioning in a section on Future Work. For example, do chief complaints also change during an outbreak season? If so, do they become more uniform and converge on a presumed diagnosis of “influenza” rather than describing symptoms? What chief complaints are used for patients with influenza inside and out of influenza season? How accurately could we identify patients who actually had influenza using existing chief complaint classifiers?

- Major Compulsory Revisions

None

- Minor Essential Revisions

The figures and tables seem to begin with the wrong numbers rather than beginning with 1.

- Discretionary Revisions

The manuscript was very clear. However, there was one sentence for which I could not understand the reasoning: page 12 – “We infer that baseline data from non-pandemic years are not useful in assessing the true scale of a pandemic outbreak.” To me, that fact did not follow from the data provided in the paragraph, and I would appreciate a better description of how the data lead to that conclusion.

It would be helpful if the table headings contained more information so that they can stand alone. For instance, Table 1 – correlation coefficients with what (the reader will know after reading the methods, but the table should really stand alone for those skimming the paper or only looking at figures/tables.
I would be interested in the authors’ opinions about why the ICD-10 codes for influenza patients during non-influenza season seem so unrelated to influenza.

If one applied a syndrome classifier (e.g., the ESSENCE ICD classifier) to ICD codes of patients during and outside influenza season, what proportion of positive influenza patients would be captured with the classifier? It seems the answer may be “very few,” since the most frequent codes are so dissimilar to influenza, but because the correlations are only performed for codes that occur frequently (I think), it could be interesting to know the case detection sensitivity, specificity, PPV, and NPV of existing ICD classifiers, which do not require an exactly accurate ICD code but any of a list of potential codes to classify accurately a case of influenza-like-illness.

Very well written - the intro and background were outstanding.

**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