Reviewer's report

Title: Modeling and detection of respiratory-related outbreak signatures

Version: 5 Date: 29 August 2007

Reviewer: Howard S Burkom

Reviewer's report:

General

These last points are about the sensitivity-vs-specificity results across models and the interpretation of those results. The new Figure 8 is more illustrative, and the accompanying discussion more detailed, but I cannot agree with all of that discussion, and some of it refers to results that were not shown.

1. The statement that "Except for Minneapolis/St. Paul, the random weekly and daily time series components in Model 1 yield higher sensitivities, compared ... Model 2, and ... Model 3" seems true only of the Chicago set. In MinnStPaul, Model 3 is a bit better, and it's really hard to say regarding Akron (which is why charts would be clearer), but an independent 3rd person agreed with me that Model 3 looks better there too.

2. The new statement about the "insignificance of the day-of-week fixed effect in Models 2 and 3" and about the AIC results is given without numerical evidence. If the authors want to make these arguments, they need to quantify them. In fact, Table 1 suggests a significant day-of-week effect in the data except for Chicago, so the reader needs to see those model coefficients and their significance.

Additional ideas suggested by the new figure and discussion. I am not trying to expand the scope of the paper, but these considerations seem natural from looking at Figure 8, and reference to them may be helpful in the authors' discussion:

3. From the Akron and MinnStPaul sets of results, will the detection performance of the Model 3 also equal or exceed that of the ones with autoregressive terms in other environments, such as Columbus and Milwaukee?

4. Is the drop in Model 3 performance in Chicago solely because of those fixed-effects day-of-week terms? Would dropping those terms make it as good as Model 1?

5. Figure 3 shows a day-of-week effect in the visit counts, and would that effect alone take care of the weekly time series patterns in Akron and MinnStPaul in models 2 and 3, so that dropping those dow effects might give something effective in all 3 environments shown?

6. It is noteworthy that the SARIMA model alone can deal with data with or without day-of-week effects.
I am sincerely not trying to delay the publication of this manuscript, and if the authors will address these points, I will try to look at their response as quickly as possible. I would even be willing to expedite these final points by telephone.

------------------------------------------------------------------

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

------------------------------------------------------------------

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)

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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