Reviewer's report

Title: Surveillance of Febrile Patients in a District and Evaluation of Their Spatiotemporal Associations: a Pilot Study

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Reviewer: Karen Olson

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I have mixed feelings about this paper. On the one hand, I like the topic. Monitoring fever in patients who visit the emergency department (ED) is a good idea. It is an objective, quantifiable measure that has meaning and is associated with infectious disease. And because infectious illness is the concern, spatial surveillance is appropriate. The study is described as a pilot and hence the data is rather limited, in fact, only one month is analyzed. This begins the problems I have with the paper.

Major Compulsory Revisions

1. First, I had a question. Is temperature a variable routinely collected for ED patients? Fever is a variable we tried to evaluate at the hospital where I work, but temperature was not often measured. Thus, we were unable to reliably code for fever.

2. 40 clusters were reported. Does that not seem like a lot? In an actual surveillance system, how would one handle so many clusters each month? There should be some discussion regarding what kind of response could be implemented in a system that had so many signals. Perhaps this is alluded to in the limitations section but I would like to see specific mention of what the authors think is going on when there are 40 clusters in such a short time span. Can some or most be ignored, and if so, why?

3. My next problem with the paper is its organization. Is there a Table 2 as referred to on page 6? I only see a Table 1. It repeats data that is reported in a paragraph on page 6. Because the table is not well organized and difficult to follow, I think that for the most part, information presented in the text should be taken out of the table. The table should only have numbers that are difficult to summarize in text without sentences becoming unreadable. Also, in the parts B and C of Table 1, what are the percents?

4. For Figure 2, I wonder if we should be plotting exact patient locations in publications. Could the points be randomly offset some small distance so that they convey the overall picture but do not map exactly to where each patient lives? And when presenting the details regarding the clusters over time, does the reader need the street map? It makes for a pretty picture, but is that detail necessary?
5. Something I found confusing were the results around age. Who is contributing to the significant results, young children or older adults? Apparently, patients with fever are younger than those without but both means describe older adults. However, the standard deviations are quite large (roughly half the mean), so are there a lot of children with fever who pull down the mean age? If so, what accounts for the results regarding fever patients in residential homes for the elderly (RCHE)? Would age effects be clearer if age groups were better analyzed? While there appears to be an attempt to do this, why are there 2 analyses with a categorical age variable and not one analysis that includes all age groups of interest (e.g. <= 12, >12 to <65, and 65+). The presentation of results for the clusters has similar problems in terms of reporting age effects. While I get the impression that being in a RCHE is somehow related to the clusters, I still wonder about the contribution of children because the standard deviations for age are so large.

Minor Essential Revisions

6. I am not fond of Figure 1 which is difficult to read. Instead of a bar chart, would it be better to plot the numbers and connect the points with 2 lines, one for patients with fever and one for those without fever? And perhaps each tick mark on the horizontal axis does not need to be labeled, allowing for a bigger font for those with labels. It would be good to mark the beginning of each week so that one could check visually for day-of-week patterns.

7. Because the data are so limited, I would like to see a better discussion of this. I wondered several things: 1) Why were the authors only able to analyze data for 1 month? 2) Is it feasible to establish a surveillance system in this institution? Can whatever limited the data for study be overcome so that a system could be implemented? Is it possible to automate processing? 3) What response is anticipated when clusters are detected?

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

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

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