Reviewer's report

Title: Epidemic features affecting the performance of outbreak detection algorithms

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Reviewer: Jinfeng Wang

Reviewer's report:

B. Responses to comments of Reviewer #2 Prof. Wang

1. Major Comments

#1: The authors take great efforts to simulate using observed and simulated data, Are the results of the paper are applicable to new data different from their used, why ?

Answer: Simulated outbreaks superimposed onto authentic data are likely to be most useful when there is a need to evaluate algorithms and surveillance systems rigorously under a range of assumptions in a realistic setting(Buckeridge DL, Burkom H, Campbell M, Hogan WR, Moore AW, Bio AP: Algorithms for rapid outbreak detection:a research synthesis. Journal of Biomedical Informatics 2005, 38(2):99-113). This study inserted literature based simulated outbreaks into notifiable infectious disease data, and used quantitative methods to find the relationship between epidemic features of diseases and detection performance. We consider the results is valid for new data if it is covered in the design of our study.

Response:

I am not convinced the argument. I hope the author response seriously.

Answer: In our study, we obtain the algorithms' optimized parameters at the false alert rate of 5%; the results showed that the MPM had better detection performance(sensitivity, timeliness) than EWMA and CUSUM. This need to be validated for new data as the data pattern may be different from ours. The relationship of baseline counts, outbreak magnitudes with detection performance are consistent with those studies (1. Wang L, Ramoni MF, Mandl KD, Sebastiani P: Factors affecting automated syndromic surveillance. Artificial Intelligence in Medicine 2005, 34(3): 269-278.; 2. Jackson M L, Baer A, Painter I, Duchin J: A simulation study comparing aberration detection algorithms for syndromic surveillance. BMC Med Inform Decis Mak 2007, 7:6.).

Response:

I am not convinced the reply
Answer: Thanks for the referee's question. In our understanding, the disease features at least include clinical feature and epidemic feature. For clinical feature, it includes clinical symptom, physical sign, serious about a disease, etc. The epidemic feature includes what the referee said above (infectiousness, spatial distribution, incubation),

the prevalence of the epidemic, outbreak size, time distribution, population distribution, etc.

#2: Which the disease features effect the performance of a model(s), which not, why?

Answer: The role of algorithms is to detect aberrancy rapidly and accurately in population by automated surveillance. The epidemic feature can affect the transmission of disease in population, thus impact the incidence of disease. So we consider epidemic features affect the performance of outbreak detection algorithms. However, the clinical feature does not impact the incidence of disease, so it does not affect the performance of outbreak detection algorithms.

Response:

Author said that the performance of the models are up to the epidemic features. So how can the results of the paper be applicable to data which is different from the author used?