Reviewer’s report

Title: A dynamic neural network model for predicting risk of Zika in real-time

Version: 1 Date: 30 Mar 2019

Reviewer: Qian Zhang

Reviewer's report:

The authors have addressed most of my questions and concerns, and I appreciate the hard efforts the authors had made to improve the quality of the manuscript.

However, I am still not convinced that the proposed methodology is sufficiently novel. Eventually this is a just binary classification problem with a classic "shallow" neural network model. What I was asking in the original comments was not to compare the performance over different machine learning models. My concern is "what are the benefits using neural networks?". Computationally neural networks usually are more expensive than other statistical learning models (logistic regression, for the simplest example). Usually for learning problems, there are some reason why you choose a particular model, and I would like to see the logic behind.

Regarding to another comment in my first review:

"7. It would be better to have ACC as function of relative time (wrt peak time for each country), rather than simple average ACC. I think for most of weeks it is easier to get correct low risk predictions, which may help averaging performances. I am more interested to see the stability of performance (similar to Figure 7, but relative to peaks)."

I know each country has different peak time, so I was asking "relative to peaks", i.e., the week at peak == week 0, the one week before peak == week -1, the two weeks before peak == week -3, etc. In this way you can clearly compare the performance over countries.

The paper is clearly written and the methodology proposed is interesting and potential for future applications. However, to publish in a high-impact journal like BMC Medicine, I still believe more information is needed to make the argument more convincing.
Responses to comments from Reviewer 1:

The authors have addressed the most of questions raised by Reviewer 1. However, regarding to the second question "How well (or bad) do simpler models (e.g. linear models) perform?", similar to the major concern raised by me, the authors still did not give a clear answer. Indeed, comparisons between models are not the main focus of this study. However, if simple statistical models can solve the same problem with comparative or even better performance, using shallow neural network approaches may not be necessary considering its computational complexity and the risks of not converging in training. I think both reviewers did not question if this methodology is good enough, but whether there is no other alternative algorithm for this particular task.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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