Reviewer's report

Title: Forecasting incidence of hand foot and mouth disease using BP neural networks in Jiangsu province, China

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Reviewer: Yanchen Bo

Reviewer's report:

This work compared two types of widely utilized methods, i.e., BP neural networks and ARIMA, by applying them to a real world long-term HFMD case with further consideration of various climate covariates, which may provide new insights in disease control and prevention of HFMD in China. However, I am not convinced by the findings of this work for now as I have a few main concerns on both technical design and paper scientific writing.

Main issues:
Methods/experimental design: For a fair comparison between two models, the ARIMA should also consider various climate covariates in modeling. Thus, based on current manuscript, I am not convinced by the results "ARIMA model performed the worst in the three models. It could not be used to predict the real data, with a MAPE as high as near to 40%" in Line 41-43. Also, be careful to use the second conclusion that is a very strong judgment.

Moreover, for Figure 3 and table 2, I highly doubt that this parameter specification (101,110) of ARIMA model from reference [12] is also representative or best suitable for the HFMD case of this work, as they used totally different data within different study area.

Background section (Line 67-77) lacks necessary literature review, for instance: (1) as I know, many HFMD studies have considered different climate covariates in time series analysis, even in ARIMA model. What kinds of climate factors did they utilize? (2) Is this work the first study to apply BP model for HFMD time series analysis? If not, how did they specify BP model, with or without considering climate factors?

Section "BP neural networks" (line 93-103): due to that BP is the final selected model, only one short paragraph herein to introduce BP is totally not enough, especially when compared with next section "ARIMA model" in which authors introduced mathematical formulas. In addition, referential index (line 93 and 104) in sub-level titles seems not correct for publication.

Results: the authors need to give the final model outputs of two climate factors (temperature and rainfall) and their lag effects, which is a vital finding for HFMD control and prevention in this study.

The conclusion (line 277-282) section need to be much improved to give more useful information focusing on the HFMD finding in this paper.
Minor revisions
Be consistent of terminology: hand foot and mouth disease (line 49, 285) or hand, foot and mouth disease (line 25, line 53) or hand, foot, and mouth disease.

Line 163: the sub-level title here seems not appreciate, may be "statistical software"

Line 165-167: The authors should clearly introduce how they selected these eight factors (x1-x8) before or within this section, such as why using 1-4 months (x1-4), and what types of lag effects (x7 and 8).

Line 36: "both in" to "in both"
Line 47: "important" to "importance"
Line 245: "So" to "so"

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

Unable to assess

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.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published
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