Reviewer’s report

Title: A spatial-temporal statistical analysis of health seasonality: explaining HFMD infections within a children population along the Vietnamese south central coast

Version: 0 Date: 26 Apr 2019

Reviewer: Reviewer 2

Reviewer's report:

PEER REVIEWER ASSESSMENTS:

OBJECTIVE - Full research articles: is there a clear objective that addresses a testable research question(s) (brief or other article types: is there a clear objective)?

Yes - there is a clear objective

DESIGN - Is the current approach (including controls and analysis protocols) appropriate for the objective?

Yes - the approach is appropriate

EXECUTION - Are the experiments and analyses performed with technical rigor to allow confidence in the results?

Yes - experiments and analyses were performed appropriately

STATISTICS - Is the use of statistics in the manuscript appropriate?

Yes - appropriate statistical analyses have been used in the study

INTERPRETATION - Is the current interpretation/discussion of the results reasonable and not overstated?

Yes - the author's interpretation is reasonable
OVERALL MANUSCRIPT POTENTIAL - Is the current version of this work technically sound? If not, can revisions be made to make the work technically sound?

Probably - with minor revisions

PEER REVIEWER COMMENTS:

GENERAL COMMENTS: Many thanks for asking me to review this manuscript. The authors report the analysis of temporal statistics of health seasonality of HFMD infections among a population of children in Vietnam from 2012 to 2016. Social contact and preschooling amongst children under five were observed as driving factors of HFMD.

However, there is an insufficient analysis of the spatial model. There is no particular spatial model used in this study, which makes the manuscript become a temporal analysis or time series analysis of HFMD. I strongly suggest that the authors include a spatial model to map the affected area.

ADDITIONAL REQUESTS/SUGGESTIONS:

1. For this manuscript to be titled "spatial-temporal analysis", the authors should include a defined and specific spatial model.

2. The manuscript would benefit from a review for epidemiological definitions and language.

3. My concern about the Fourier series analysis is that the classical periodogram used in your Fourier series is not a good estimator ('inconsistent estimator') because the number of parameters grows with the number of data points, which is not applicable in this study. However, the Fourier transforms, and its probabilities also depend on several strong assumptions that are rarely achieved in real data: evenly spaced data of infinite duration with a high sampling rate, Gaussian noise, single frequency periodicity with sinusoidal shape and stationary behavior. Each of these constraints is violated in various problems. Shape may be non-sinusoidal (e.g., elliptical orbits, eclipses). Periods may not be constant. I strongly suggest that the authors look into this critically by improving the estimator and graphical representation using the "smoothing method".

Note: This reviewer report can be downloaded - see attached pdf file.

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.

Yes

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

Yes

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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