Reviewer’s report

Title: Climate factors driven typhus group rickettsiosis incidence dynamics in Xishuangbanna Dai Autonomous Prefecture of Yunnan province in China, 2005-2017

Version: 0 Date: 25 May 2019

Reviewer: Prasad Liyanage

Reviewer's report:

In this manuscript you have attempted to address an important public health issue. However the manuscript need extensive improvement in clarity, logical sequence and methodology. Please pay your attention to my comments given below.

1. The title should spot out where the study being conducted and the period. However the author has given priority to distributed lag non liner modelling design in the title itself. The study should not be another example of using the dlnm, it has a broader perspectives.

2. The background section lacks an elaboration on the life cycle or the transmission dynamics of the vector without which it is difficult to imagine where the lag period should fit in from the exposure of weather variables to onset of the disease. Instead the author has elaborate more on the distributed lag non liner model and related applications. I strongly recommend to add information of vector bionomics, disease transmission dynamics including extrinsic and intrinsic incubation period of the pathogen and control and preventive measures that is taken. What tis the relative public health burden of TGR in your setting (eg: mortality, permanent disability, economic burden)?

3. The objective of the study is not clearly stated. The authors have attempted to identify the exposure-lag-response association between weather variables and the TGR to be used as an early warning for public health authorities. Saying "better comprehend TGR ecology and provide precisely theoretical basis for the prevention of TGR” is too broad and doesn't direct the reader to the real objectives. The introduction lacks the logical sequence of events.
4. In the methods section under the sub heading of study setting, more details are needed about the climate and the presence of climate monitoring stations. A figure of area map would be appropriate.

5. In the data collection section, the authors mentioned about two diagnostic criteria, how similar or different are they? What is the sensitivity and specificity of clinical diagnosis of TGR? Where the monitoring stations of China Metrological Data Sharing System are located? How proximal these centers are to the study setting? How complete the data are? Presence of missing values or outliers? These information is needed to validate the results and linking them to the final conclusions of the study.

6. It is worthwhile analyzing the influence of ENSO using SST or ONI as explanatory variable.

7. The data analysis section lacks clarity. To evaluate correlation between TGR cases and meteorological factors as mentioned in lines 109 to 111, I strongly advise to consider cross correlation function which include lagged correlation.

8. The basis definitions in the cross-basis function in terms of lag period and climate variables were not mentioned. How the maximum lag dimensions for climate variables were selected when defining the basis matrix should be elaborated with related scientific evidence. Algebraic definition of the model used is not mentioned.

9. Have you included all corresponding cross-basis matrices for temperature, precipitation and relative humidity in a single model or have you developed separate models for each variable? Whether the interaction of each variable is evaluated in one regression model is not clearly mentioned.

10. For quasi-Poisson models AIC cannot be calculated directly. It should be quasi-AIC. To be more transparent in the methodology, I would like to see how the authors calculated quasi-AIC in the model selection process. I strongly recommend to provide evidence on model fit of the selected model in terms of residual deviation plots and PACF plots in a supplementary material.
11. In the results section lines 135 to 138 the information given is merely a repetition of the table-1.

12. Figures embedded in the manuscript are of very poor quality and axis labels are difficult to read. Axis labels should be revised giving the units of measurements.

13. There is a dramatic reduction of TGR cases after 2014 in the time series diffusing the seasonal patterns. Please explain the reasons behind and the potential impact on the results of the model.

14. Correlation matrix given in table-2 is meaningless for cases when it is calculated at lag 0 as in this case. Column names need revision.

15. Figure-2, the font size of the axis labels should be increased to improve the visibility. The reference values for each weather variable should be mentioned in figure caption to easy interpretation. Why the author selected lag up to 18 weeks for temperature, up to 30 weeks for relative humidity and up to 22 weeks for precipitation is not clear and not mentioned in the methods section. Needs justification based on bi annual seasonal patterns observed.

16. Figures 3, 4 and 5, the figure scales are different even within on variable which cause confusion. The protective effect observed for lower precipitation is relative to the median value (2.41mm/week) not the absolute effect of dry or "no rainfall" conditions. The U shaped association thus observed is relative to the reference value selected and cause miss interpretation of the results. I strongly recommend to re-analyse and re-do the plots using lowest value for temperature, relative humidity and precipitation as the reference value.

17. Please mention how your findings would assist in implementation of public heath preventive and control activities of TGR.
Level of interest
Please indicate how interesting you found the manuscript:

An article of importance in its field

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

Not suitable for publication unless extensively edited

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