Reviewer's report

Title: Association of dengue fever outbreaks and climate in China

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Reviewer: Xiao-Nong Zhou

Reviewer's report:

The dengue fever (DF) is one of serious infectious disease epidemic in China in history. And it is quite interesting to see the manuscript focused on the correlation between climate factors and epidemic events of DF in southern China. The authors selected the climate variables from three epidemic cities (Guazhou, Fuzhou and Nibao) from 1990 to 2006, and then correlated with the incidence of the outbreaks. Three main results were found: (1) there was significant difference of the minimum temperature in June between the great scale epidemic year and small scale epidemic year (P=0.014, P<0.05); (2) weather variables were positively correlated with DF outbreak with 3-10 weeks lagged effect, then projected map for predict the DF focal zones in August by overlapping several climate variable, e.g. temperature, humanity and rainfall; (3) a statistic equation was established for incidence prediction with the minimum temperature of June, sunshine time of October, average temperature of January, and humidity of November, and then by using the equation to estimate the incidence of each year for the study period, and compare the real epidemic data.

The following points need to take into account for the authors in the further study:

1) The topic of the correlation between epidemic data of DF and climate variables, but the authors forgot the main factor of those epidemics due to the population mobilization, by which the virus of DF is able to cause the outbreak events. And then the second kind of main factors we need to consider those “factors affecting the transmission dynamics of DF are vector survival and development characters and arbovirus incubation time in mosquitoes” which was written in the introduction part of the manuscript. And finally the factors on climate variables we need take account which may influence the biological process of both virus and mosquitoes. If all of us agree with above concept, then the second results of the manuscript is out of the reasonable hypnosis, which maybe better to take away from this manuscript.

2) It has been seldom to use the correlation equation to predict the epidemic events without considering the mechanism of disease transmission. The correlation equation is only be used for the explanation on the disease epidemic pattern and its impact factors with their contribution to the disease transmission. In this study results, several climate variables, e.g. minimum temperature of June, are hard to explain their contribution to the disease transmission in terms of biological mechanism or ecological characters. Therefore, the authors need to explain or discuss on this part, and it is better to improve the the prediction by adding more factors in addition to climate variable, since simply predict the
epidemic events by using climate variables may turned out the inaccuracy prediction for the risk areas of the DF epidemic.

3) All prediction models will generate the prediction results as did in this manuscript showed both in result 2 and result 3, but it is better to add the process on model assessment/evaluation by using several approaches, e.g. error/sensitivity analysis.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

'I declare that I have no competing interests'