Reviewer’s report

Title: Assessing Chikungunya risk in a metropolitan area of Argentina through satellite images and mathematical models

Version: 0 Date: 14 Aug 2015

Reviewer: Eric HY Lau

Reviewer's report:

The paper assessed the Chikungunya risk on introduction of the virus in Florencio Varela, Argentina. While the model provides a series of estimated risks in different months and neighborhood, some of the details in the methods and results were not provided for assessment of the model performance. The use of satellite image is novel but was limited to 6 images over 1.5 years. It may worth exploring whether rainfall data can be used to enhance its time resolution.

Major Compulsory Revisions

Methods

1. Line 131, up to 50% of the population was allowed to move between neighborhoods. Could you clarify how long the period was referred to?

2. Line 133, please clarify "mosquito movement was restricted to a small fraction of the available population". Do you mean the movement was restricted geographically?

3. Line 134, is there a seasonality pattern in the flight distance of mosquito?

4. Line 134, could you provide the details how the flight distance is incorporated in the model?

5. Line 152-154. Is the local data for rainfall available? The wetness obtained by satellite image provides the geographical detail but lacked the time resolution (6 measurements in 1.5 years) and is a limitation. If rainfall data is available, would it be possible to combine the two measures?

6. Line 156, could you provide some detail of the wetness index, so the readers can understand what -50 means.
7. Line 164, what was the time step used for the simulation?

8. Line 165-167. The main focus of the study is to assess the effect of introduction of Chikungunya virus. It is important to provide details about how the virus was seeded into the population in the simulation. For example, what is the location, timing during the month, etc.

9. The model results depend on the parameters. It is essential to describe how the model parameters were selected.

Results

10. Line 159, it would be informative to provide a figure with the smoothed values for the total area in the results.

11. Were the results sensitive to how the virus was seeded?

12. The model incorporated symptomatic and asymptomatic infections. It will also be interesting to see how the two numbers increased over time in the simulated epidemic.

13. Line 186, a very high probability of Chikungunya outbreak (95%) was estimated for March, and high probability for December to July. To understand the performance of the model prediction, does that match with the reported case in Florencio Varela in March for the previous years?

14. Figure 5, y-axis, do you mean 'infected' instead of 'affected' population?

15. Figure 5, there was a sudden drop in % of affected population in each neighborhood. There was no such subtle change in temperature (Fig 3) or probability of invasion (Fig 4). What was the reason of this result? Also, is this consistent with the number of reported Chikungunya case in May?

16. It is informative to provide the simulated mosquito population size over time.

17. Figure 6. Could you clarify what do you mean by saying the population 'at risk'? do you mean expected number of infections or other meaning?
Discussion

18. Line 215, please clarify which outcomes in this study were consistent with the listed works?

19. Line 227-230, while the preventive measures (1) and (2) are probably effective. However, the corresponding results were not reported in the study.

20. The limitations of the study was not described.

Supporting Material

21. Please define the states, (G, D, C, etc.)

Minor Essential Revisions

22. Line 212, typo "hight"

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

No

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.

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:

Acceptable
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