Reviewer’s report

Title: Factors associated with Human West Nile Virus Infection in Ontario: A Generalized Linear Mixed Modeling Approach

Version: 0 Date: 11 Jan 2018

Reviewer: James Sejvar

Reviewer's report:

Reviewer comments: INFD-D-17-01640

Response to Authors:

This interesting and well-written article by Mallya et al. seeks to address climactic and geographic factors that may influence the human risk to West Nile virus (WNV) in Ontario, Canada. Although Canada has seen far fewer cases of West Nile fever (WNF) and West Nile neuroinvasive disease (WNND) than in the United States, the group authoring this article have done a very good job of thoroughly investigating environmental factors, including monthly temperatures and precipitation levels, as well as number / percentage of positive mosquito pools for WNV, and drawing from this several intriguing risk factors for human WNV infection in any given year. Their conclusions are that factoring in such variables as mean 'off-season' temperatures and precipitation, as well positive mosquito pools in any given area, may assist in predicting the likelihood of a more severe human WNV season in any given year. The article is well-written, clear, and the conclusions, for the large part, seem sound.

A few specific comments on the manuscript follow:

1. The authors place a great emphasis on geoclimatic factors in the month of February, which they conclude is a significant variable / risk factor for subsequent WNV activity during transmission months. However, they provide no speculations / hypotheses for this phenomenon in the discussion (or, at least, minimal hypotheses). This reviewer would like to see a more expansive discussion by the authors as to why geoclimatic factors in the month of February would have such a significant effect on their human WNV infection predictions.

2. It is unclear as to whether currently known risk factors for WNV (older age, immunosuppression) were included in the logistic regression model. The authors are commended for taking such an expansive approach in to looking at environmental / climactic changes may influence WNV incidence / prevalence, but seem to somewhat gloss
over the currently known risk factors for WNV. Could the authors further expand on the age stratification in each of the PHU’s that are described?

3. Along these lines, in Table 2, it is interesting, even curious, that the highest incidence of human WNV infection seems to be the 35-44 age groups. Most prior studies of the epidemiology of WNV suggest that it is older populations (>55-60) that are at greater risk for symptomatic WNV. Do the authors have a hypothesis / speculation for this observation?

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.

Unable to assess

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 recommend additional statistical review

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

Acceptable

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