Reviewer’s report

Title: Airport sentinel surveillance and entry quarantine for dengue infection following fever screening program in Taiwan

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Reviewer: Benjamin M. Althouse

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The current study has been very well revised by the authors, and have addressed many of my critiques and those of the other reviewer’s. However, there are still several areas of concern I have before I can recommend publication.

- Major Compulsory Revisions

Here is a list of major problems still needing to be addressed:

• It is still not clear to me the case definitions. My impression from the manuscript is that “domestic” and “imported” cases are identified from national databases as cases who have not and have traveled within 2 weeks of developing symptoms (Figure 2), I am still unclear however about figure 1 and the calculation of PPV, NPV, etc. How are those cases identified? Are they described here (pg 6): “For effective surveillance, both passive surveillance mechanisms, such as hospital-based reporting systems, and active surveillance methods, such as health statements from inbound passengers, self-reports, expanded screening for contacts of confirmed cases, patients with fever of unknown origin and school-based reporting, and community screenings, were established in central and local health departments.”? What is “effective” surveillance? Please make the distinction in the “Case definitions” section, as the formulation of this effects the calculation of PPV, NPV, sensitivity and specificity.

• The calculations of PPV, NPV, sensitivity and specificity are suspect to me. I do not know what exactly is being calculated. Is “total dengue importations” the total number of cases, reported in the national database who have traveled out of the country 2 weeks before symptom onset? Or is it the number of cases identified for the “effective surveillance”? Either way, then the low PPV could be due to either: 1) infections arriving by methods other than plane, 2) infections which are actually secondary but in people who have coincidentally traveled recently, or 3) cases who are not yet symptomatic when screened in the airport (as stated by the authors). These are biases and limitations that should be mentioned in the manuscript.

• Additionally, the use of ecological data to calculate these numbers is open to many biases. How confident are the authors that the national database captures all the cases? What about those cases who do not report seek medical care? Are there any individual-level data gathered at the surveillance sites? Also, a few
sentences on the airports in Taiwan would be helpful – are many cases being imported through other airports?

• There are still numbers in the paper that do not appear in tables (pg 7: “between 0.46 and 2.58% and between 31.5 and 50.9% (3706-5656/11,121-12,553) of the incoming febrile travelers”, pg 11: “cases increased yearly (e.g., 40.5% (72/179) in 2007, 44.7% (101/226) in 2008, 53.9% (110/204) in 2009 and 42.2% (129/304) in 2010)” and pg 12: “imported versus domestic cases varied widely (i.e., 2.98–22.5)”).

• I have trouble with the conclusion (pg 11): “Moreover, we revealed that the number of reported imported dengue cases peaked earlier than the reported domestic dengue cases by 2–4 months”. No data has been presented on the no-lag (t=0) case. Even though lags of 2 months or 4 months are statistically significantly associated with domestic cases, how do we know these lags are better? The trend in r^2 appears to be decreasing with increasing lag. Also, what is the justification of the choice of two months? The generation time of dengue is only two weeks.

• I also have trouble with the conclusion (pg 12): “Most of all, the distinct impact of dengue importations on community dengue epidemics was due to the ecological heterogeneity.” This is not supported by the data presented. First of all, the numbers for the slopes (“2.98–22.5”) are no longer presented in the manuscript (I had to return to the previous draft), and secondly, are not directly comparable as presented. The slope for a (t=2) is the number of domestic cases two months in the future for one imported case now, the slope for (t=3) is the number of domestic cases three months in the future for one imported case now. For a proper comparison to be made, they must be the same lag.

• The authors misuse the term “asymptomatic”. Asymptomatic cases are those that are infected but never develop symptoms. The authors state (pg 12): “the low PPV of our results with respect to border control utilizing NCITs for reducing the risk of introducing infectious etiological agents into a country is primarily limited by the asymptomatic (afebrile) viremic passengers who bypass the temperature threshold of the NCITs”. This is a valid limitation (but not the only one, see above): they are referring to individuals who have not yet developed symptoms, but will be identified and counted later by physicians. Those who are truly asymptomatic will never develop fever and be missed (presumably) by the national surveillance system. I would rephrase the language to enhance clarity.

• Along the same lines (pg 14): “According to 3 studies, the proportion of symptomatic dengue patients vs. asymptomatic patients is 1:0.75, 1:1.8 or 1:3 [18]. Therefore, only 25%-57% of imported dengue cases appear with symptoms. Half of those symptomatic dengue cases can be detected by airport quarantine, but half of the cases are latent and can only be discovered after symptoms have appeared and patients seek medical attention.” It should be made clear that the “half of the cases [that] can only be discovered after symptoms have appeared and patients seek medical attention” are not asymptomatic, but not-yet-symptomatic. I would rephrase this sentence to clearly delineate between those that are not-yet infectious and those that are truly asymptomatic. Also, where does the “half” in “half of the cases are latent” come from? I would say
“some of the symptomatic dengue cases” and “the other cases are latent”, or something similar.

- Minor Essential Revisions
There are still grammatical errors throughout the manuscript.
I’m not sure what the authors are referring to when they say a “robot vector” (pg 12 and 16).

- Discretionary Revisions

**Level of interest:** An article of importance in its field

**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.