Author’s response to reviews

Title: Effects of El Nino-Southern Oscillation on Dengue Epidemics in Thailand, 1996-2005

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Version: 2 Date: 13 October 2009

Author’s response to reviews: see over
October 13, 2009

RE: BMC Public Health MS 949588073264443

Dear Dr. Norton:

Thank you for your encouraging response to our work. We are also grateful to both reviewers for providing such constructive comments that help us improve our paper. We have revised our manuscript accordingly, with the alterations highlighted (underlined). The point-to-point responses to reviewers’ comments were listed as below.

Besides, we improved the style of written English in the revised manuscript with the help of a professional copyediting service. We also corrected the format of file to ensure that the revised manuscript conforms to the journal style. All of these alterations are also highlighted (underlined).

Thank you again for your kind consideration and we look forward to hearing from you soon.

Sincerely yours,

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To Reviewer 1:

Thank you for your positive response to our work and the constructive comments that help us to improve our paper. We have revised our manuscript accordingly, with the alterations highlighted (underlined). Our revisions and responses are listed below:

1. *Introduction should be shorted into 3 paragraphs. The references are too much and some are repeatable, such as ref. 8-15 can be reduced to 14-15, ref.32 and 33 should cite only one, ref. 39 is not necessary, should cite only the main and currently ref.* *Figure legends should show under the figures for the better understanding.*

   We have shortened Introduction to 3 paragraphs (page 4–5, revised manuscript) and reduced the numbers of references as you suggested. BMC Public Health requires that figure files should not include the legend, and the legend(s) should be listed in the manuscript file after the References. (see the Author checklist for manuscript formatting: 8 (iii) at the website: http://www.biomedcentral.com/info/ifora/medicine_journals).

2. *Needs some language corrections before being published.*

   We have used a professional copyediting service to improve the style of written English in the revised manuscript, with the alterations highlighted (underlined).
To Reviewer 2:

Thank you for your positive response to our work and the constructive comments that help us to improve our paper. We have revised our manuscript accordingly, with the alterations highlighted (underlined). Our revisions and responses are listed below:

1. **Page 3:** “The temporal sequence between El Niño and occurrences of dengue epidemics, an important criterion for causal inference, has not yet been thoroughly investigated” I would add a reference: “The temporal sequence between El Niño and occurrences of dengue epidemics, an important criterion for causal inference, has not yet been thoroughly investigated (but see [35]).”

   We have added the reference #35 in the revised paragraph (page 4, line 23, listed as reference #15, in the revised manuscript). Thank you!

2. **Page 5-6:** “Surveillance for Dengue Cases” Some precisions are needed for (i) the definition of what is an epidemics, when it starts, ... and (ii) about the fact that some region has been aggregated.

   The word *epidemic* means “an increase in the number of cases of a disease above what is expected” (see Dwyer DM, Groves C: Outbreak epidemiology. In: Infectious Disease Epidemiology: Theory and Practice. Second edition. Edited by Nelson KE, William CM. Sudbury, Jones and Bartlett Publishers 2007, 147. listed as reference #28 in the revised manuscript) (page 7, ll. 11–13, revised manuscript). Since dengue is an endemic disease in Thailand, we defined that a province had a dengue epidemic when the monthly incidence of all reported cases, including both dengue fever and dengue hemorrhagic fever, per 100,000 populations exceeded the provincial 10-year-mean from 1996 through 2005 (page 7, ll. 13–17, revised manuscript). The 10-year mean of the monthly incidence was calculated by province, as indicated by the red dashed line in Figure 2, rather than aggregated by region (page 7, ll. 17–18, revised manuscript).

3. **Page 9:** Descriptive Epidemiology. I suggest to mix and to reduce the two paragraphs of this sub-chapter.

   We have mixed and reduced the two paragraphs of this sub-chapter to one paragraph in revised manuscript (page 10, ll. 3–13.).

4. **Page 10:** Temporal Correlation between ENSO indicators and Dengue Epidemics. One needs to know what is precisely an epidemic.
Thank you for your advice! We added a subheading “Definition of dengue epidemic”, in the Method section to explain what is precisely an epidemic, as below:

The word epidemic means “an increase in the number of cases of a disease above what is expected” [28]. Since dengue is an endemic disease in Thailand [27], we defined that a province had a dengue epidemic when the monthly incidence of all reported cases, including both dengue fever and dengue hemorrhagic fever, per 100,000 populations exceeded the provincial 10-year-mean from 1996 through 2005. The 10-year mean of the monthly incidence was calculated by province, as indicated by the red dash line in Figure 2, rather than aggregated by region. (page 7, ll. 11–18, revised manuscript)

5. Page 11: The authors should introduce a quantitative statistics for the comparison of the two approaches used, and should remove the Figures 4 and 5, a Table seems more adequate.

We remove Figure 4 and 5, and summarize the data with new Table 4 (page 30–31, revised manuscript) and Table S1 (page 37–38, revised manuscript). The Pearson’s correlation coefficient between the regression coefficients obtained from analysis using quasi-likelihood estimation and that from analysis using negative binomial models were 0.99 for MEI lag 1–11 months, and 0.98 for SLP lag 1–11 months, respectively (page 12, ll. 4–7, revised manuscript).

6. Pages 9-11. I regret that it was not possible to analyze the effects of the “local” precipitations. Do you think that it is no possible to use some precipitation datasets obtain from model at large scale? Or to find in some database observed or reconstructed precipitations of these 2 regions?

Relative humidity is an indicator of the likelihood of precipitation (page 15, line 19, revised manuscript). The present study also shows that the monthly average local relative humidity in the prior 3–6 months was negatively associated with epidemics of dengue and incidences of dengue cases in both the southern coastal and northern inland mountainous regions of Thailand. (page 15, line 19–23, revised manuscript).

7. Page 12: “The feasibility of determining the association between ENSO and incidence of dengue cases with simple statistical models had been previously explored, with variable success [11,13,36]” the authors should add the reference [35].

We have added the reference #35 in the revised paragraph (page 13, line 21, listed as reference #15, in the revised manuscript). Thank you!

8. Page 13: “The robustness of the modeling method was further verified by the
demonstration of the predictive ability of regression model fitted from 1996–2004 data for out-of-fit 2005 data in each province.” A quantification of this point is needed.

The percentage of correct predictions by the fitted models for the occurrence or the absence of dengue epidemics in the 12 months during 2005 were 83-100% in 12 out of the 13 studied provinces (Table S2). (page 12, line 21–23, and page 39 new Table S2, revised manuscript).