Author's response to reviews

Title: Dynamics of Plasmodium falciparum and Plasmodium vivax in a micro-ecological setting, southwest Ethiopia: Effects of altitude and proximity to a dam

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Author's response to reviews: see over
Responses to comments on Ms: MS: 2013148897133880

Title: Dynamics of Plasmodium falciparum and Plasmodium vivax in a micro-ecological setting, southwest Ethiopia: Effects of altitude and proximity to a dam

We thank our respected reviewers for giving us their valuable comments to improve the status of the manuscript. Most of the comments are acceptable and corrections have been incorporated accordingly. All the corrections are done in track change and visible throughout the document, including tables, 1, 2 and 3.

Reviewer 1.

1. Description of the spatial-temporal & map of Pf and Pv suggested:
   - We believe that table 2 & 3 with the related nations address the spatial distribution of the disease while table 4 with its narration dedicated to the temporal (trend) pattern of the diseases. However, we did not consider map presentation as the regression tables quantify the occurrence of both species by buffer zones, altitudes and over time.

2. How population heterogeneity affects the results was raised. We greatly acknowledge our respected reviewer for reminding us this important point.
   - We considered data analysis again and, hence, made adjustment of the underlying population density by incorporating the number of population in each respective buffer zones around the GGHD and ranges of altitude as an offset variable in the Poisson Model. Consequently, the contents of tables 2 and 3 as well as figures in the related paragraphs throughout the document have been modified accordingly.

3. How are pattern of Pf & Pv correlated?
   - We did not correlate the two species. We simply analyzed their relative proportions just to see which one is increasing/decreasing over space and time in relation to the other.
4. What is the role of climatic conditions on observed patterns? Discussion in relation to relevant recent local finding was also suggested.

- We thank the reviewer in indicate us important area to be considered. However, the scope and objective of the current study will not encompass influence of climatic variables. It will be our future work.

5. Need for further analysis to support the findings was suggested.

As the data of this study come from record review, we have limitation of variables to include and consider different models. Yet, as indicated under # 2 above, we incorporated the number of base population in the model as an offset variable in the model. Moreover, the study subjects are categorized into age groups and included in to the regression model.
Reviewer 2.

Major comment:

Comparison of the current finding (all age groups) with a previous finding from a study done on children only has been raised.

- The comparison of current study with study done on children has been discussed in light of malaria risk level between those who live near to the Dam and those who live away from it. In malaria unstable areas, if proximity to a dam is risk factor for children, it can also increase malaria risk among other age groups who live near the dam compared to their counterparts who live away from the dam.

Minor comments:

Abstract section

- On average, P. vivax was 54%... edited as … P. vivax was 52%...

Background section

- previous local studies related to distribution of the disease by space/time have been highlighted as suggested (p. 5, paragraph 1).

Results section

- paragraph 4, line has been edited based on the exact figure in the table as suggested.
- Variable “sex” has been put consistently in the tables 1 to 3.
Reviewer 3.

1. Table 1 has been commented to be presented by “… clustered multiple variable graph”. We acknowledge the concern of the reviewer. However, the categories are too lengthy to topsider a graph. So, we preferred to omit the column percentage and leave the table with numbers and row percentages. The proportions of the species (column) are described by narration in the preceding paragraph. Hope, it is not difficult to grasp the contents of the table now.

2. We tried to refrain from putting too much explanation in the results. However, we have still fear not to confuse reader with limited information though all are in the respective tables.

3. P value is suggested to be put along C.I. and standard error to indicate level of significance.
   - Base on the suggestion from our reviewer, we have included P values in the respective regression tables.

4. Issue of P value indicated under # 3 above.

5. Editions have been made on page 12 as suggested by the reviewer. However, the last editorial comment regarding the phrase “… the rate of P vivax increments were 130% and 40%…” was not considered, since the IRR is 1.40; so, the difference is 40% not 140%.

6. LLITNs : has been written in full words before the abbreviation (P. 15).

7. ‘… geo-referenced.. ’ explained in the methods section (pp. 6 & 7 )

8. “Incidence rate ration (IRR)”… in Poisson model refers to ratio of counts which is not exactly what we understand in epidemiology as a speed by which new cases of a disease occurs per unit time in at risk population.

9. “54% … in abstract” has been edited as 52%.