Author's response to reviews

Title: Definition and characterization of localized meningitis epidemics in Burkina Faso: a longitudinal retrospective study

Authors:

Haoua Tall (htall@aamp.org)
Stéphane Hugonnet (hugonnet@who.int)
Philippe Donnen (philippe.donnen@ulb.ac.be)
Michèle Dramaix-Wilmet (miwilmet@ulb.ac.be)
Ludovic Kambou (kambouludo@hotmail.com)
Frank Drabo (drabofranck@yahoo.fr)
Judith E Mueller (judith.mueller@ehesp.fr)

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Author's response to reviews: see over
1. Reviewer’s report:

Minor issues not for publication

- Methods: (paragraph 3) Give the percentage in numbers, not in letters

Authors’ reply:

We have given the percentage in numbers.

- Method: Maybe you could define here Health Center (HC) and localized epidemics (LE) so there are not so many acronyms to define in the Tables and Figures.

Authors’ reply:

As tables and figures need to be interpretable independently of the text, the abbreviations would need to be indicated in the footnotes in any case. “Health center” is not used in abbreviated form in the text, so we prefer not to add this in the methods section.

- Discussion: (paragraph 5) There is a ‘(5)’ which I do not understand what it refers to? (should be ‘[5]’?).

Authors’ reply:

We corrected in the text. It should be [5] and it refers to the 5th reference.

- Table 1: (legend) ‘within a given year’: remove ‘in’
Authors’ reply:

We removed ‘in’ from the sentence

- Figure 1: (legend) Boxplots are only for the HC level. You could simplify (and clarify) the legend.

Authors’ reply:

We have revised the legend in Figure 2 which contains the box plots and it reads now: “Boxplots show median, 25th and 75th percentile and range of annual incidences at health centre level and red marks show district level annual incidences. Dotted lines indicate annual incidence of 0.1 per 100, previously used as a retrospective definition of epidemics at the district level [7]”

Discretionary Revisions

- Abstract: results: I would rather insist on the time gained and on the difference in annual incidence in LE/non-LE

Authors’ reply:

We agree that these points are important findings of the presented approach, but under the need to summarize in the abstract, we would like to stay with the description of localized epidemics, rather than orienting the reader towards vaccine operations.

- Results: (paragraph 8) You should give results for epidemics declared at district level vs localised epidemics for LE75, not only for RT@HC. It would better explain why you decide to investigate RT@HC more deeply.

Authors’ reply:

The results are in Table 2, and the fact that district level declaration is more timely than LE75 is stated in the first sentence.

- Results: (paragraph 8) The last 2 sentences are a bit redundant; it could be ‘34 with consecutive epidemic declaration in the districts (among which 20 were identified at least one week in advance).
Authors’ reply:

The two sentences are different as the last one refers to districts that declared an epidemic during a given year whereas the first one refers to (20 LE detected in) districts that did not declare an epidemic. We added “in the district” to clarify.

- Discussion: (paragraph 2) When defining LE75 as the retained epidemic definition, you should give the main results of sensitivity, specificity, and positive predictive values again.

Authors’ reply:

We do not agree, but we understand that this is a question of personal preference. In general, it is recommended not to repeat results in the discussion but summarizing them.

- Discussion: (paragraph 8) It would be interesting to know which epidemic definition is used in Mali and Togo where the reactive vaccine campaigns are based on the health centre level incidence data.

Authors’ reply:

It is the WHO definition for communities <30,000 population, sometimes adapted to individual experience.

- Figure 4: It is not the most elegant way to present the results. Rather have a single line around adjacent LE for the given year, or a circle around each LE.

Authors’ reply:

We appreciate the recommendation but the lack of precise cartography of the region led us to this presentation. Adjacent LE for a given year are represented with a single line around and each LE also has a single line except Fofó which was a LE two consecutive year.

Minor Essential Revisions

- Abstract: The English level is fine in the article, except in the abstract. You should correct it.
**Authors’ reply:**

We had a native-speaker review of the manuscript and assume that additional language errors will be corrected during the production of the proof.

- Abstract, Results: you must give the Positive predictive value along with the sensitivity and specificity if you are tackling a public health problem.

**Authors’ reply:**

As mentioned before, given the word count limitation of the abstract, we preferred not insisting on the vaccine operation aspect of the results, but stay with the task of defining localized epidemics.

- Method: You should define district-year and health center-year, and explain how you compute the length of the localised epidemic? Is it minimally 2 weeks for the 2 weeks used to test the epidemic definition on, or can it be only 1 week?

**Authors’ reply:**

We added the definition for duration of localized epidemics, but thought that the explanation of what a district-year is would be redundant in an audience acquainted with basic epidemiological methods.

- Method: (paragraph 4) You cannot affirm ‘the threshold with the best diagnostic performance was chosen’, as it is a trade-off between sensitivity and specificity

**Authors’ reply:**

We added “with I the optimised diagnostic performance”

- Results: (paragraph 2) Make clear what the P-value refers to in (Figure2, P<0.001). This was not explained in the method section, unless it refers to a Poisson model, in which case I do not understand how you test this.

**Authors’ reply:**

The P-value refers “Annual incidences differed significantly between health centres within the same district year”, we moved the information to avoid ambiguity.
- Results: (paragraph 8) 95 localized epidemics detected: but 40+20+34=94!!

Authors’ reply:

We corrected the number of localized epidemics, the total is 95.

- Results: (paragraph 8) what is the PPV of 63% relating to? Are you counting district*year or health center*year?

Authors’ reply:

We are counting health center-year. 63% for RT@HC to predict localized epidemics before/after epidemic declaration in the district

- Discussion: (paragraph 1) ‘Precisely to a few calendar weeks’ This is already the case for epidemic definition at district level

Authors’ reply:

We have rewritten: “is that it allows attributing an epidemic event precisely to specific communities and the exact calendar weeks, “. In district level analyses, the weeks in epidemic are not precise as the average for the whole district.

- Discussion: (paragraph 1) the analysis is also and mostly based on data collected at the health center level

Authors’ reply:

We changed the wording to make clear that we mean the commodity of working with national routine data, which do not need to be collected by specific studies.

- Discussion: (paragraph 10) You do not ‘avoid a bias’, but you can overcome it.

Authors’ reply:

We changed the wording in the sentence to be most precise.

- Discussion: You should insist more on the positive predictive value, which is rather low when considering RT@HC epidemic definition (17%) instead of LE75 (50%), and what it means in terms of public health perspectives (false alarms).
Authors’ reply:

As mentioned before, we would not like to go into a detailed discussion about whether surveillance guidelines should be changed or not. This paper provides evidence for such a discussion, but is mainly a proof of concept for health centre level analyses.