Author's response to reviews

Title: Intervene before leaving: clustered lot quality assurance sampling to monitor vaccination coverage at health district level before the end of a yellow fever and measles vaccination campaign in Sierra Leone in 2009

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Author's response to reviews: see over
Dear Dr Michelle Shardell,

Thank-you very much for reviewing our manuscript; please find a revised version addressing the minor changes recommended by the reviewers.

Our work has benefited greatly from this review. We are looking forward for the manuscript to being finally accepted.

The detailed response to the comments is available below.

Sincerely yours,

Dr Lorenzo Pezzoli

Detailed response to the specific comments of the referees:

**Reviewer 1: Mark Myatt (MM)**

*MM:*
*I think the article would benefit from further proofreading.*

Authors (A):
We have proof read the article further, also taking into consideration comments from Reviewer 2.

*MM:*
*Figure 1 could be much improved if redrawn with x-axis limits of 65% and 100%.*
*The y-axis label should be something like "Probability of classification". The title is confusing as the probability increases with coverage. This is the inverse of what is implied in the title.*

A:
We have updated Figure 1 according to suggestions.

*MM:*
*Figure 2 is an interesting and informative addition. I think that this could be modified for black and white printing. If kept in colour then the number of colours used should be reduced (see: [http://en.wikipedia.org/wiki/Four_color_theorem](http://en.wikipedia.org/wiki/Four_color_theorem)) and standard mapping colours used.*

A:
We have updated Figure 2 in black and white according to suggestions.
MM:
Figures 3 & 4 could be combined. These seem rather small and of poor quality in the supplied PDF.
A:
We have combined the two figures (now figure 3). We have saved the excel graph as a PNG, hopefully the resolution has improved.

MM:
Figure 2: It is a little disappointing that some discussion of the applicability of PPS to coverage problems was not prompted by this map. PPS places data collection in the most populous communities. These are the easy to cover communities. PPS also does not yield a spatially even sample as can (e.g.) be clearly seen in the sampling locations of Moyamba district.
A:
Good point that we had in fact overlooked; we now discuss this in the limitations.

Reviewer 2: Banu Cakir (BC)

BC:
1) The revised version seems to delete many paragraphs that caused a confusion in understanding the underlying theme of the paper, and did a good job in introducing C-LQAS as a method to investigate vaccination coverage even before leaving the region, to enable mop-up activities in a timely manner.
A:
Thank you.

BC:
2) The authors added some detail on “variation of alpha and beta values in C-LQAS methodology according to the hypothesised distribution of coverage in the clusters compared with the mean coverage in the entire lot”- which was missing in the earlier version.
A:
No further comment required.

BC:
3) I found Figure 1 unnecessary, yet, does not need to be deleted, if page limits are appropriate.
A:
We have not deleted Figure 1. Instead, we have reformatted it according to the suggestion from Reviewer 1.

BC:
4) Limitations of the study is discussed properly in the revised text.
A:
Thank you. We have also added the limitation of the PPS sampling method as suggested by Referee 1.

BC:
5) The authors discuss DEFF and its potential affect on conclusions on the vaccination coverage rates. Yet, it is not clear to me how they used this in comparing coverage rates based on C-LQAS and CS after the survey (Tables 3 and 4). How are the confidence intervals on Tables 3 and 4 are calculated? Did the authors make any correction for design effects in the C-LQAS phase or for CS,
or both? Some detail is needed in explaining Tables 3 and 4 and how DEFF was used in comparative analyses.

A: Unfortunately, the CS survey was not conducted by the same team that conducted the LQAS surveys (i.e. our team). In presenting the CS survey results we had to rely on the data available from the unpublished survey report. Perhaps this was not clear in the manuscript. We have rephrased this, especially in the methods, and quoted the data as “unpublished data” as recommended by the BMC guidelines for authors. The reviewer may be referring to the previous version of the manuscript when he recommends that additional details are needed to explain the coverage rates presented in table 3 and 4. As recommended by the previous review of this manuscript we are not presenting the results of the CS surveys in tables 3 and 4. As for the DEFF, we haven’t used it in the comparative analysis, but we simply relied on the 95% confidence intervals of the vaccination coverage figures. We have attempted to make this clearer in the “Methods” section.

BC: 6) Lastly, the scientific language of the manuscript could be improved. There are unnecessarily long sentences, it is hard to follow the text. Some revisions are suggested on the original document, and is attached.

A: Following this and the similar comment from Reviewer 1, we have proof-read the manuscript further, taking into account the suggested revisions.