Reviewer’s report

Title: Sample size calculation for estimating key epidemiological parameters using serological data and mathematical modelling

Version: 2 Date: 18 Jan 2019

Reviewer: Research Square

Reviewer's report:

"STATISTICAL REVIEWER ASSESSMENT:

Is the study design appropriate for the research question (considering whether the analyzed population accurately reflects the design and whether you see any problems with control/comparison groups, e.g., likely confounders)?
Yes - overall design, population, and control groups are appropriate

Are methodologies adequate and well implemented (considering whether assumptions are addressed and whether analyses are robust)?
No - there are minor issues

Are the analyses adequately communicated (considering whether reporting details are adequate and whether figures and tables are well labeled and described)?
Yes - important reporting details are present, analyses are adequately communicated, figures and tables are well labeled and described

Does the interpretation accurately reflect the analyses without overstatement (considering whether limitations/bias are acknowledged and whether accurate descriptors, e.g., 'significant', are used)?
Yes - interpretation accurately reflects analyses, limitations/bias are acknowledged, accurate descriptors are used

Could an appropriately REVISED version of this work represent a statistically sound contribution?
Probably - with minor revisions

STATISTICAL REVIEWER COMMENTS:

This study is rigorous and has added to the body of knowledge. It is also very useful in epidemiological surveys as it ensures that under-representations are minimized as much as possible. In addition, the study will help ensure that scarce resources are used judiciously.

The provision of a detailed supplementary file made it easy to follow the paper. It also showed that the authors painstakingly thought out their work.
REQUESTED REVISIONS:

Line 160 The authors need to clearly state rationale used for each of the three mathematical models for estimating the force of infection were considered for infections under endemic equilibrium

Also, the assumptions for each of the model must be stated. Also, there must be an "evaluation" that shows that the assumptions are not violated. These are currently missing

Line 246-247 Authors should state what each value in the brackets represent. I suppose it is for the age groups

Minor
Line 279-283: The authors should give plausible reasons why mumps and parvovirus required higher sample size compared with measles, VZV, and rubella.
Table 1: Again, authors should state what the estimates stand for
Each panel of figure 2,3 and 4 should be labelled so as to enhance readability

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable
Declaration of competing interests

Please complete a declaration of competing interests, considering the following questions:

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