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Laura White
Editorial Board Member
Scientific Reports

Dear Editor,

In response to the comments of the reviewers on our manuscript, we have made the following modifications to the manuscript:

Reviewer 1: Responses to the main comments are listed below. The minor comments where also integrally accepted, namely the improvement of the README in the code repository as well as the citation of two additional papers.

1. The response to this comment is two part: first, we performed a simple study to assess whether our method of estimation of R_t provides more conservative credibility intervals and thus offers protection against false alarm. In agreement with the analytical result shown in equation (16), our simulation study – described at the end of the section on the tail behaviour of the distribution of R_t section – shows that our method provided wider CIs in $\approx 90\%$ of the time. Then, in order to assess the ability to recover the parameters, simulation experiment was done, as requested and included as a new section in the supplementary material. The simulations shows that the inference methodology can recover the exact parameters used to simulate the data.
2. The text of the methods section was improved to answer the four issues raised in this comment.
3. The Introduction and discussion sections were expanded to included the additional information required by this comment.

Reviewer 2: Minor comments: Fixed typo in the abstract; Added text to the discussion stating that we expect the effects of underreporting to cancel out in the calculation of the attack ratio. Moreover, a section explaining the details of DREAM (delayed rejection, adaptative MCMC, etc.) was added to the Appendix.

1. Reference 5, despite having similar concepts as those discussed in our paper, has quite different goals. we have however, cited another publication (ref 26), which is from the same group and based on the same field study, and use their findings about seroprevalence in the 'results and discussion' section.
2. We have not found articles combining the use of aggregated data

to study variable force of infection, however we have reviewed other works modeling variable FoI (refs 7, 8, 9, 10, 12).

Having fulfilled all the demands of the reviewers we re-submit the modified manuscript and await the the final decision. As always, please do not hesitate to contact us if further questions arise.

Sincerely

Flávio Codeço Coelho
Professor