Reviewer’s report

Title: Sample size considerations using mathematical models: an example with Chlamydia trachomatis infection and its sequelae pelvic inflammatory disease

Version: 2
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Reviewer: Richard Gray

Reviewer’s report:

Accurately calculating the sample size required to observe statistically significant differences in study populations is essential to ensure adequate study recruitment while minimizing costs. The work presented by the authors uses a simple mathematical model to demonstrate how understanding the dynamics of Chlamydia trachomatis infection transmission, disease progression, and resulting sequelae can inform sample size calculations—particularly for RCTs of chlamydia screening. This approach seems useful for the design of trials and studies in general.

I have no major concerns with the manuscript and I think the paper is suitable for publication in BMC Infectious Diseases. I do have some minor suggestions for the authors to consider.

Minor revisions

1. In the introduction I think it would be worthwhile outlining what is involved in a sample size calculation—particularly the need to estimate the possible relative risk that can be measured prior to performing the study.

2. The authors present their approach generally and for a previously completed study. I think it would also be valuable to present a sample size calculation for a theoretical future. This would further demonstrate the importance of this approach when performing sample size calculations in the planning stages of a study and show readers how to incorporate the approach into their work.

3. In the discussion it would nice if the authors could describe how this approach could be applied to other diseases and study types.

4. I noticed a typo in the caption of Table 1: remove (max 15 words) from the end.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable
 Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests: 
I declare that I have no competing interests