Reviewer’s report

Title: Antibiotic resistance detection is essential for gonorrhoea point-of-care testing: A mathematical modelling study

Version: 0 Date: 07 Apr 2017

Reviewer: Jeffrey Klausner

Reviewer's report:

A timely and well-written description of a modelling exercise investigating the relative impact of different types of gonococcal infection detection assays with a focus on anti-microbial resistant infections.

This article expands on a previous mathematical model of the spread of resistance in Neisseria gonorrhoeae by modeling the impact of point of care resistance testing among a high-risk and a low-risk population to compare 1) the spread of infection, and 2) the spread of resistance as impacted by point of care testing vs. culture vs. NAAT testing. The utility of point of care testing is clear, and this paper makes an important contribution to the literature calling for increased efforts in the development of point of care testing. It also provides information that will help guide that development.

Introduction

1. Lines 15-16: NAATs take 90-180 minutes not several days. In routine use it might be longer because of batch testing, but clarification and a reference would be helpful here.

Methods

No Comments.

Results

2. Please present the sensitivity analysis in the results section.
Discussion

3. Lines 218-219: The authors state: "POC tests with no or low sensitivity to detect resistance accelerate the spread of resistant infections." That sentence is misleading as in their results the authors state that even a slight decrease in sensitivity of POC tests for resistance (80-95%) leads to faster spread of resistance than culture. Please re-phrase that sentence, as it is important for future researchers to be well aware of the need for highly sensitive POC tests.

Conclusion

4. Lines 300-302: The authors conclude their study "...can be used to help design trails comparing different test strategies and guide the introduction of POC tests in the future." However those are not conclusions from the results presented, but rather an interesting point of discussion. I would remove it from the conclusion and add it to the introduction or discussion section.

Figures & Tables

5. The titles of Table 2 and Figures 1, 2 and 4 should be more explicative. Tables and figures should stand on their own, independent of the paper.

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

Yes

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.

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