Reviewer’s report

Title: Modelling the impact of chest X-ray and alternative triage approaches prior to seeking a tuberculosis diagnosis

Version: 0 Date: 11 Jun 2018

Reviewer: Nicolas Menzies

Reviewer's report:

Summary:

This is a well-written paper on an aspect of TB control that warrants greater attention - how individuals are identified to receive TB diagnostic tests. My major concern with the analysis is that the issue of false positive diagnosis does not appear to be considered, and this may bias the evaluation towards more sensitive approaches at the expense of specificity.

Major points:

1. Page 4, Costing: I find it difficult to interpret the cost implications if treatment costs are not considered, as changes in sensitivity and specificity will have predictable consequences for treatment costs.

2. Page 5, Operational Model: for a sequence of diagnostic tests, the sensitivity and specificity of the algorithm is not necessarily a function of the sensitivity and specific of the individual tests alone. It seems that the analysis assumes conditional independence of all tests - is this correct? At the least I think this warrants discussion, and it may need investigation in the sensitivity analyses, even if there is little data to say whether this assumptions holds.

3. Page 5, Operational Model: in an earlier section there is discussion of clinical diagnosis for the smear/Xpert negatives, but I cannot see the performance characteristics for clinical diagnosis included in Table 2. I realize that the sensitivity and specificity of clinical diagnosis is difficulty to judge (and potentially setting-specific), but I am not sure it can be ignored.

4. Page 6, Results: Results are reported in terms of various performance measures, but I don't see how one algorithm can be judged better than another if false-positive diagnosis is not considered. It appears that the only penalty for reduced specificity in the triage test is increased costs for other subsequent tests.
Minor points:

1. Figure 2: this figure should be very useful for understanding the model, but at present is hard to read, and some icons appear to be unexplained.

2. Page 4, line 46-47: The sentence beginning "The two diagnostic algorithms…” might need to be rephrased.

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.

No

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

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Please indicate the quality of language in the manuscript:

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