Author's response to reviews

Title: Cost-effectiveness analysis of PCR for the rapid diagnosis of pulmonary tuberculosis

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R3

This is a covering letter with a point-by-point description of the changes made in manuscript

**Cost-effectiveness analysis of PCR for the rapid diagnosis of pulmonary tuberculosis** MS: 9534281932436370

Manuscript revised with point-by-point description of the changes made.

**Reviewer 1:**

**Reviewer's report**

**Reviewer's report**

**Title:** Cost-effectiveness analysis of PCR for the rapid diagnosis of pulmonary tuberculosis

**Version:** 6 **Date:** 17 November 2009

**Reviewer:** Suzanne Marks

**Reviewer's report:**
I believe the authors addressed all my concerns including adding a limitations section that Steve Weis (reviewer 1) also wanted. However, I have discovered some arithmetic errors that will need to be corrected in the tables and text before publishing. The entire article will also need some good editing for language and to ensure that all data are consistently reported in all sections. Some errors that I have found are:

*abstract line 50: the amount $1,513,760 does not match Table 3.

The manuscript was changed in the abstract as the reviewer indicated in lines 52 and in the table3 (new version).

* line 252: PCR dot-blot not “bolt”

The manuscript was changed in the results section as the reviewer indicated in lines 254 (new version).

* the discussion section could really be improved. There is a reference (lines 314-318) to cost-effectiveness findings of the AFB smear/dot-blot compared with automated PCR, which was not presented in the current study.

The manuscript was changed in the discussion section as the reviewer indicated in lines 318-324 (new version).

* table 2 has been improved, but 2C would be better with the addition of 2 columns, one for total (inpatient and outpatient) costs of AFB/S&C and another for AFB/PCR blot-dot. Please delete the last statement of the footnote: “Opportunity costs were not applicable.” Several cost categories were collected that represent the valuation of opportunity costs.

The manuscript was changed in the table 2 as the reviewer (new version) indicated in footnote of the table 2.
*Table 3. Under the title of Laboratory costs, I believe the first item should be “labor” and not laboratory costs. There might have been some confusion when I had the authors replace labor costs with Lab costs in Table 2, but labor costs might be appropriate in Table 3.

Also on Table 3, the Total cost categories do not add from the above categories. I get 191,000 for total patient costs of AFB/S&C, 5,448,239 for total health services, and 5,651,960 for total screening costs. Likewise, the categories don’t add for AFB/S PCR dot blot.

The manuscript was changed in the table 3 as the reviewer (new version) indicates. The values were calculated and the numbers were revised.

So,

<table>
<thead>
<tr>
<th></th>
<th>Total Health Service Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5,444,960</td>
<td>1,464,660</td>
</tr>
<tr>
<td>Total Patient Costs</td>
<td>190,800</td>
<td>34,000</td>
</tr>
<tr>
<td>Total Screening Costs</td>
<td>5,635,760</td>
<td>1,498,660</td>
</tr>
</tbody>
</table>

*Table 4. The new totals from Table 3 need to be displayed under item 4A in this table. Even using the incorrect totals listed in the current Table 4, I could not justify the $13,888 for cost per accurately diagnosed AFB Smear/PCR dot-blot; I get $14,642 (1,595,960/109). For the next number in that column, I get 14,191. I get some more numbers that are different from those in the remaining table cells.
In Table 4: the Cost per case of TB correctly diagnosed was 50,773 for the AFB smear plus Culture and 13,749 for the AFB smear plus PCR dot-blot.

The Cost per case of TB correctly diagnosed and case of TB falsely diagnosed and treated (true positives and false positives), for the AFB smear plus Culture, was 50,319 (Total screening costs/ 112 (true positives and false positives cases) and 11,440 (Total screening costs/ 131 (true positives and false positives cases) for the AFB smear plus PCR.

In Table 4: the Cost per case of non-TB correctly and incorrectly diagnosed and not treated (true negatives and false negatives), for the AFB smear plus Culture, was 34,156 (Total screening costs/ 165 (true negatives and false negatives cases) and 10,260 (Total screening costs/ 146 (true negatives and false negatives cases) for the AFB smear plus PCR.

Some of these might be due to rounding errors, but others seem way too large for rounding errors. There should be a footnote on the cost of treating false negatives, to show the calculation for number of cases

The manuscript was changed in the table 4 in the footnote as the reviewer indicated (new version).

. On the last row, it appears that the numbers presented are 1000 times more that they should be (a decimal error?).

We assumed that each 10 TB patients not diagnosed, will transmit *M.tuberculosis* for 100 individuals and the cost-effectiveness was expressed for 1000 suspects.

The Cost of return of all false negatives to the health service for each strategy = Estimate of cases of TB (5%) using the estimative of
transmission of false negatives in 1000 TB suspects vs Total Screening Costs for each strategy.

So,

For AFB smear plus Culture strategy, the Cost of return of all false negatives to the health service:

\[ 66.5 \times 5,635,760 = 374,778,045 \]

For AFB smear plus PCR dot-blot strategy, the Cost of return of all false negatives to the health service:

\[ 74 \times 1,498,660 = 110,900,855 \]

The manuscript was revised in the table 4 as the reviewer indicated (new version).

*Table 5: I could not match the base case first row estimates with those in the preceding tables. And, the last set of columns again appear to have a decimal error (are 1000 times what they should be).

We assumed that each 10 TB patients not diagnosed, will transmit *M.tuberculosis* for 100 individuals. The cost-effectiveness was expressed for 1000 suspects. The manuscript was changed in the table 5 as the reviewer indicated (new version).
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