Reviewer's report

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

Version: 3 Date: 11 May 2009

Reviewer: Suzanne Marks

Reviewer's report:

This version has improved over the previous one, with the authors making many (but not all) of the suggested changes. I believe another round of edits is needed to make this acceptable for publishing. Here are my comments.

1. the authors should mention that the cohort is the same as from the 2007 BMC publication, which published the median PCR time of 3 days and smear/culture of 30 days.

2. the authors need to add a "Limitations" section, which should include mentioning of the following:
   a. Since the respiratory specialists were blinded to culture PCR results and lab technicians blinded to chest radiograph and clinical predictors results, the study is not one of the use of PCR dot-blot in a real world setting, and, as such, the cost-effectiveness is estimated, not measured
   b. In-house PCR results are not necessarily generalizable, unless the replicating site uses the exact same in-house PCR.
   c. The authors should explain the possible impact of including the 23 specimens that were below the PCR detection limit, and why they weren't excluded
   d. Stratification of results by HIV status was not done
   e. Mortality was not measured for either strategy
   f. Isolation use or contact investigation was not included in the analysis

3. Consider making the following language edits:
   a. Explain that ZN is acid fast bacillae (AFB) smear, as I believe that is more commonly used
   b. Use the word "estimated" when explaining what the authors did regarding computing cost-effectiveness
   c. Delete lines 196-199, replace with "A sensitivity analysis was performed to assess the effect of the various parameters (TB prevalence, sensitivity, specificity, and variable costs) on the conclusions."
   d. Instead of using "current situation" for example on line 243, standard economic language uses "base case" or status quo.
   e. Replace "non treated" with "not treated"
   f. Delete the sentence on lines 327-329. you didn't show this
4. Correct the following errors:
   i. Abstract results 2nd sentence: The total screening costs were similar for ZN/PCR and ZN/culture. this needs to be changed to say that total screening costs (latest version Table 3) are nearly 8.5 times for ZN/culture vs. those of ZN/PCR
   ii. Line 75: for ruling out or considering pulmonary tuberculosis
   iii. Line 231 PCR dot-blot $1,577 (not 1,576,60). There are multiple places throughout the document that are using the comma instead of the decimal point.
   iv. Line 247-248: I believe you are comparing more "rapid" techniques, to standard techniques such as the ZN/culture
   v. Line 284: "evolution" should be "evaluation"
   vi. Line 308: was greater for ZN plus
   viii. Line 189: you are assuming that one FN patient transmits TB to 10 others. While each infectious TB case averages 10 contacts, only about 30-40% become infected with latent TB infection and only 3 to 8 percent of them will develop TB disease. This also needs to be corrected in Table 4
5. I did not check all the references, but someone needs to look at them again
6. I cannot assure that the study conclusions are correct until the tables have been revised:
   a. While Table 1 is fairly comprehensible, the sensitivity and specificity results should be moved for clarity as to which strategy that they are associated with
   b. Table 2:
      i. Table 2b should be titled Laboratory costs, not Labor costs and the last column is showing commas instead of decimal points.
      ii. Table 2c: I don't understand why the per patient per day costs differ for each strategy: I get $3.33/day for food under ZN/culture and $5/day under PCR; for income I get $5.83/day under ZN/culture and $8.75/day under PCR
   c. Table 3 is incomprehensible to me as it is presented. Since many of the changes in the analysis from the previous version to this one are based on this table, it is important that both the authors and reviewers understand what is in them. In one table you have per day costs, another per strategy, and another per patient. Also, I don't understand why the ZN/culture per day costs changed, since I understand that placing all the culture results into 30 days changed many of the results. I suggest reorganizing it into separate tables that clearly list for each the unit cost, units (e.g., days, patients, etc.), and total costs. The footnotes show commas instead of decimals.
   d. Table 5: on the cost per case per TP and FP columns, for the current situation, I could not find the match to 20,587 and 2,665 on Table 4. And, in the FN columns, I could not find the match to 22,933 and 3,363 in Table 4. In the Specificity of PCR row, the current situation should be 85% (not 84%). All the
ratio columns are using commas instead of decimal points.