Reviewer's report

Title: Trends in TB Case Notification over Fifteen Years: The case notification of 25 Districts of Arsi Zone of Oromia Regional State, Ethiopia

Version: 2 Date: 22 February 2014

Reviewer: Christopher Parry

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This is an interesting and useful report on the impact of the expansion of DOTS provision on TB notifications in a zone in Ethiopia. Expansion of DOTS sites has led to an increase in TB case notifications. Variations in the increase in TB notifications were found in different areas of the zone. There are a number of issues with the presentation and interpretation of the data.

I am concerned that the data for 1997 and 2011 is for only part of the year. As we do not know if there is seasonal variation in notification rates I think only complete years should be analysed – that is 1998 to 2010. For example the biggest increase in notifications from one year to the next was from 1997 to 1998, but the 1997 data only covers 4 months of that year.

The definition of the measurements made should be made clearer.

I am concerned that the multivariate analysis should not include the HIV-TB data and the expression of the results of the analysis should be more cautious.

The text could also be written more clearly at a number of points. The discussion could be shorter without loss of content.

Major compulsory revisions

1. Methods, Study design and data collection: TB case notifications were studied between 1997 and 2011. However, in the 1st paragraph of the Results the time period was September 1997 to June 2011. As we do not know if there is seasonal variation in the notification rates I think only complete years should be analysed – that is 1998 to 2010.

2. Methods, Study Design, Measurements: Please detail how the case detection rate, the TB-HIV co-infection rate, DOTS sites and DOTS population coverage (in Fig 1 and Table 2) were calculated. In particular it is not clear how the TB-HIV infection parameter was determined.

3. Results, Fifteen year average TB notifications by districts, paragraph 3: I am concerned about the validity of this multivariate analysis. In particular I am not clear that HIV status can be included as (I assume) this is a sample of the patients notified and not comparable with the data for all notifications.

4. Results, Fifteen year average TB notifications by districts, paragraph 3: I think the care should be taken in using the terms “predictors” and “less likely” or “more likely”. The analysis is looking at associations between one variable and another and one variable is not necessarily predictive of another. For example,
rural areas were associated with lower notification rates compared with urban areas. There may be a variety of reasons for that which might include truly lower rates of TB in rural areas or alternatively lower rates of access or attendance among patients with symptoms.

5. Results, Fifteen year average TB notifications by districts, paragraph 3: It is not possible from the data to say “TB patients in the age group 15-24 years were more likely to be notified than other age groups”. This would require knowledge of the true rates of TB in all age groups. An alternative could be “TB notifications were significantly more common in the 15-24 age group compared with the other age groups”.

6. Results, Fifteen year average TB notifications by districts, paragraph 3: Similarly it is not possible to say that “TB patients with HIV were more likely to be notified compared with their HIV negative counterparts”. This would require knowledge of all the patients with HIV and TB or no HIV and TB in the population. The data shows (for the sample tested) in areas with higher case notifications the proportion of HIV positive patients was higher.

7. Discussion, paragraph 5, line 1: I think better to use the 1998 and 2010 data as discussed previously.

8. Figure 1: I think it is misleading to include all the lines on the same graph as different parameters are being recorded. It would be clearer to have a series of graphs one above each other. For example a single graph for TB CN all forms and TB CN of PTB+ (/100,000 population); and separate graphs for CDR PTB+ (%), Dots sites (number) and DOTS population coverage (%). The explanation of the following parameters should be made clearer: CDR PTB+; DOTS site; DOTS population coverage. I assume x2 ternds should re not be X2 trends – these values are in the text and perhaps do not need to be repeated here.

9. Table 2: The heading could be made clearer. For example Yearly average number of TB cases notified; Yearly average TB case notifications/100,000 population; Yearly average TB-HIV co-infection. For Seru the average number of all forms of TB is 52.2 – does not need a decimal point.

10. Table 3: I am not sure that HIV status can be included in this analysis. Please explain what is meant be Population to DOTS ratio

Minor essential revisions

1. Abstract, methods: “About 41,965 cases” – why is the number qualified with about? “A total of 41,965 cases” would be better.

2. Abstract, results, line 6-7: TB patients from rural areas were less likely to be notified ….. suggest inserting “compared with urban areas”.

3. Abstract, Conclusions, Line 3: Should be “Further research is therefore recommended” …. 

4. Background, paragraph 2, 9: Should be “Moreover, evidence from northern …”

5. Methods, Study Design, Measurements, line 6-8: Does the extrapolation of population size for each year assume a constant population growth rate over the time period?
6. Methods, Study Design, Measurements, line 10: Should be “The fifteen year average of the number of all forms of TB …”

7. Results, General characteristics, line 5: Should be “…were pulmonary smear positive ….”

8. Results, Trends in DOTS Site Expansion and TB Case notifications, paragraph 1, line 1: Here and throughout when the term “DOTS Site expansion” is used it would be more accurate to say the “number of DOTS sites”.

9. Results, Trends in DOTS Site Expansion and TB Case notifications, paragraph 1, line 1: Here and throughout – the term trend here is unnecessary. Simply say “TB case notifications were significantly associated with the number of DOTS sites in Arsi zone (Fig 1, X2trends =75.2, p<0.001)”

10. Results, Trends in DOTS Site Expansion and TB Case notifications, paragraph 1, line 5: What does the X2 tend refer to here?

11. Results, Trends in DOTS Site Expansion and TB Case notifications, paragraph 2, line 1: No need for the word trend here.

12. Results, Trends in DOTS Site Expansion and TB Case notifications, paragraph 2, line 5: No need for second trend in this sentence – for example “Similar to the trend in all forms of TB notifications, PTB+ cases in the first four years of DOTS ….”

13. Discussion, paragraph 5, line 6-9: I do not fully understand this sentence – could be expressed more clearly.

14. Discussion, paragraph 6, line 4: Should the sentence read “Likewise, the CDR increased by more than six-fold in fifteen years in Vietnam”?

15. Discussion, paragraph 8, line 1: Should the sentence read “Although the CDR of this study demonstrated an upward trend …”?

16. Discussion, paragraph 9, line 1: Should the sentence read “…..the PTB+ case notification and CDR of the zone steadily increased ….”? 

17. Discussion, paragraph 9, line 7: pervious should be previous.

18. Discussion, paragraph 11, line 1: Should the sentence be “In this study, we identified variations in TB case notifications ….”? 

19. Discussion, paragraph 12, line 2: Should the sentence be “….population, with a fourteen fold variation between different districts….”?

20. Discussion, paragraph 13: Repeats what has already been outlined in paragraph 12. Paragraph 12, 13 and 14 should be combined into one paragraph.

21. Discussion, paragraph 15, line 2: Should be “… associated with the levels of TB notification.”

22. Discussion, paragraph 15, line 5-8: These two sentences do not make sense to me.

Level of interest: An article whose findings are important to those with closely related research interests.
Quality of written English: Needs some language corrections before being published

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