Author's response to reviews

Title: Estimating the magnitude and direction of bias in tuberculosis drug resistance surveys conducted only in the public sector: a simulation study

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Author's response to reviews: see over
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Dear BMC Public Health Editor:

Thank you for the opportunity to respond to the peer reviewer’s comments and suggestions for MS: 4536665103215545 “Estimating the magnitude and direction of bias in tuberculosis drug resistance surveys conducted only in the public sector: a simulation study”

We include a point by point response to the reviewer below. We have also highlighted changes in the “marked up” version of our resubmitted manuscript.

page 7, para 2, line 3: should a1-4 be replaced with aN or aP?
Yes, thank you for catching this error. We have corrected this.

page 8: it would be helpful to include the definitions of k_FN and k_RN in Table 1.
These are now included in Table 1.

page 8, para 2 (after the equation for A-A_N): this section looks more complicated than it actually is. It would be helpful if, besides using mathematical symbols, the authors could use words to say what they mean. For example, the 3rd line after this equation could be changed to read “First, all new cases go to the public sector (i.e. k_FN=1) if and only if all new sensitive and all new drug-resistant cases go to public sector (i.e. x_S=x_R=1).” At present, the argument is harder to follow than it should be as it’s necessary to keep referring to Table 1 in order to identify what the symbols mean.
We agree that this helps make these simple mathematical statements clearer. We have changed the paragraph accordingly.

The authors mentioned that they replaced all occurrences of the word “annealed”. However, the word is still used in several places: p10 line 13, p14 para 2, captions to Figures 5 and 6. Please could these be replaced. Likewise, the words “susceptible cases” on p11, line 4 should be replaced with something more appropriate,
We have now removed all occurrences of the term “annealed” and have replaced the term “susceptible” with “sensitive”

page 13 – some of this section (description of cases 1 & 2) fits better in the methods section than in the results.
We have moved descriptions of Cases 1 and 2 to the Methods section as suggested.

page 16, para 2, line 3 – it would be helpful to remind readers what k_FN and k_RN are.
We have now added this.
Figure 1: The diagram could be made easier to understand by adding the words “drug-sensitive” and drug-resistant” to the unshaded and shaded areas. Also, why are the boxes of different sizes? We have added DS and DR designation to the figure and have also added a sentence to figure caption. The boxes are different size to graphically represent the different sizes of these sub-populations in a country like India where most new cases present to the private sector, and most retreatment cases present to the public sector.

Figure 2: it would be easier to relate this plot to the equations if the authors could just include the text “x_R” and “x_S” in parentheses after the titles for the y- and x-axes respectively.
Done.

caption to Figures 5 and 6: it would be good to replace the words “are infected with MDR TB” with “have MDR TB” since, technically “tuberculosis” refers to the disease state rather than to the infection.
Done.

Figure 5: the x and y-axis titles are missing.
These axes titles have been added.

Figures 5 & 6: Again, it would be easier to relate the diagram to the equations by including the symbol (e.g. Â) in brackets after the x and y-axis titles.
We have added these symbols to the titles.

Table 1: the definitions for aN and aP are ambiguous. Perhaps they can be reworded to “fraction of TB cases in the public/private sector who acquire resistance”.
We have reworded this entry in Table 1 as suggested.

We thank the reviewer for these comments and recommendations. Thanks you for your consideration of this revised version of the manuscript.

Best regards,
Ted Cohen, Bethany Hedt, and Marcello Pagano