Author's response to reviews

Title: X-ray screening at entry and systematic screening for tuberculosis control in a highly endemic prison

Authors:

Alexandra Sanchez (alexandrasanchez@gmail.com)
Veronique Massari (massari@u707.jussieu.fr)
Germano Gerhardt (gabinete@bcgfap.com.br)
Ana Beatriz Espinola (espinola.bia@gmail.com)
Mahinda Siriwardana (siriwad@u707.jussieu.fr)
Luiz Antonio B Camacho (luiz.camacho@ensp.fiocruz.br)
Bernard Larouze (larouze@u707.jussieu.fr)

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Changes in the manuscript are indicated in bold.

Responses to reviewer 1

1. Page 3, 1st paragraph: the authors could explain more what they refer to as “passive case finding”. Although a TB-used reader would understand it, a reader less familiarized with TB may not have it completely clear on his mind.

Revised text: “In most prisons of low and middle income countries, the TB control program is limited to the diagnosis of cases among inmates attending spontaneously the prison clinic for symptoms suggestive of TB (passive case-finding)”

2. Page 4, 1st paragraph: “2) X-ray screening of inmates entering the prison within one week after admission during the study period”. Please, clarify that those cases may be transferred into this facility, which will further explain the prison’s length of stay > 24 months (duration of the study follow-up).

Revised text: X-ray screening of inmates entering the prison within one week after admission during the study period from remand centres or other prisons;

3. Page 4, 2nd paragraph: “Diagnostic criteria for TB cases were as follow:

1 - Bacteriologically positive cases: subjects with two AFB-positive sputum sample by direct microscopic examination, or positive culture for M.tuberculosis.” Please, explain what was done to only 1 positive AFB sample.

Revised text: “1 - Bacteriologically positive cases: subjects with two AFB-positive sputum sample by direct microscopic examination, or one AFB-positive sputum sample with X-ray abnormalities consistent with active pulmonary TB, or positive culture for MTB.” (references 11 and 12).
4. Page 5, 2nd paragraph – results’ section: “substantial illiteracy rates and lived mostly in poor sections of RJ city and suburb.” Please, clarify what you mean by suburb. Wouldn’t it be the metropolitan area instead?

Suburb was replaced by metropolitan area.

Responses to reviewer 2

This is an very good paper, reporting very impressive prevalence data about TB in Brazilian prisons and the impact of a screening program combining regular digital chest X-ray and passive-case finding. No major comments, only some minor comments:

1. abstract: the first mention of Rio de Janeiro (RJ) should be in clear

Correction done.

2. abstract and method: the authors state that inmates with any radiological abnormality had a sputum examination. As has been demonstrated in many studies, the yield of sputum examination is related to the nature and extension of the radiological abnormalities (see Graham S, IJTLDB 2002;6(2):137-42 and Pinto LM, PLoS One 2013;8(1):e54235). Therefore, as the numbers are large, it would have been interesting to know if the yield of screening correlated with the extension of the radiological lesions (what about the granulomas and nodular lesions?). The inclusion of inmates with minimal lesions may be the reason for the low proportion of TB cases with a bacteriological confirmation (59.2% according to tab 3).

X-ray was used only as a screening and not as a diagnostic method to identify “TB suspects” defined as inmates with any X-ray abnormality who, subsequently, had a bacteriological examination. Overall, out of 167 cases diagnosed by screening, 109 (65.2%) were bacteriologically confirmed. For the cases without bacteriological confirmation, the decision to treat the patient was based on the X-ray (see as well response to comment 6). Therefore, in the scope of the present article which is operationally oriented, we considered especially important to describe in details the X-ray lesions, in most cases minimal, observed among the 58 subjects without bacteriological confirmation. Indeed, the relatively low proportion of TB cases with a bacteriological confirmation is a consequence of the screening procedure used. The cases bacteriologically confirmed were more likely to have extensive lesions. (see additional results and comments pages 6 and 8).

3. Were the Chest X-rays interpreted with a coding or scoring system (see Pinto, above, and Zellweger JP, IJTLDB 2006;10(10):1123-26)?

We used a standardized form for X-ray interpretation. As mentioned above, our screening procedure is based on the identification of inmates with any X-ray
abnormalities whatever suggestive or not of TB in order to limit difficulties of radiologic interpretation.

4. Was the "short duration treatment" mentioned in the introduction standard, i.e. 2HRZE/4HR?

The TB patients were prescribed the combination: 2HRZ/4HR as recommended by the Brazilian Ministry of Health.

5. Who read the Chest X-rays?

The X-ray were read by two senior pneumologists: Alexandra Sanchez, Master in Pneumology, PhD in Public Health, pneumologist of the Rio de Janeiro State prison system with 30 year of experience in pneumology and by Germano Gerhardt with 35 years of experience in clinical pneumology and public health.

6. Apparently, a large proportion of the inmates with abnormal Chest X-ray had no symptoms at entry screening. The authors should confirm in the discussion that a large proportion of them was put Under TB treatment solely on the basis of chest X-ray findings. This may increase the prevalence rates.

To address this comment, we created a new variable “Presence of at least one symptom” (see revised table 3). The percentage of symptomatic cases was similar (50%) among cases diagnosed at entry or by systematic screening. We then identified among the cases without symptoms those whose bacteriological results were negative who, therefore, were put under treatment solely on the basis of chest X-ray findings (19.2% the 167 cases identified by screening). Indeed, these cases contributed to the high prevalence rates observed. As requested, an additional comment was introduced in the discussion.

7. A large proportion of inmates had a history of previous TB or TB treatment.

Which proportion of them was MDR-TB?

Due to technical difficulties, sensitivity testing was not systematic during the 2d year of study. Results of sensitivity testing on isolates collected during the first year of study were introduced in the text. These tests were performed in the National Reference Tuberculosis Laboratory. This result is commented in the discussion.

8. As the authors rightly mention, the policy of systematic screening has a cost and does not replace other measures like improved ventilation of the cells and reduction of overcrowding (which is frequently not more than wishful thinking!). The authors should elaborate a little more about the costs of the different interventions

Additional information was introduced concerning the program we recently developed in the context of the Global Fund TB and Brazilian Ministries of Health and Justice as an attempt to improve the environmental conditions in Brazilian prisons. Cost issues are further discussed in the last paragraph of the discussion.