Author's response to reviews

Title: Community health workers improve contact tracing among immigrants with tuberculosis in Barcelona

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Author's response to reviews: see over
Dear Dr Victorino Silvestre
Journal Editorial Office
BioMed Central

Thank you for giving us the opportunity to submit the new version of our manuscript “Community health workers improve contact tracing among immigrants with tuberculosis in Barcelona” (Manuscript ID 1444240714587332, section: Disease epidemiology - infectious) to be reconsidered for publication in the BMC Public Health.

As you suggested, we have included our point-by-point reply to the reviewers’ suggestions (see below). We are thankful for your comments that have helped to improve the manuscript.

I look forward to hearing from you.

Yours sincerely,

Jesús Edison Ospina, MS

**Editor's comments to author:**

1. **section methods / statistical analysis should be more detailed: choice and definition of variables included. In particular, it is not clear what is meant by "CHW intervention": from the tables it seems that it refers to the periods.**

   In the section methods / statistical analysis we have changed it according to your suggestion. We have changed in the tables "CHW intervention" also.

2. **tables 1-3, please include all the variables in the tables, and not only those who showed a significant association.**

   We have included all the variables in the tables.

3. **table 1: for age, the median or the mean age should be used.**

   We have include the median age and the inquartile range in the table 1.

4. **table 1: it would be more accurate to characterize the two periods as "before CHW intervention 2000-2002" and "after the introduction of CHW intervention". The same for Table 2 and 3: CHW intervention should be replaced by " before ....etc."**

   We have changed it according to your suggestion.
5. table 2 and 3: the data should reflect the title and show the CT not performed (1st column)".

We have changed it according to your suggestion.

6. Title page: Please include the email addresses of all authors in the title page. A title page should contain; Title, Author list, Affiliations (department names, institution name, street name, city, zip code, country), email addresses. The author list and email addresses must be identical in the manuscript file and on the submission system, and it must be clear which affiliation pertains to each author.

We have included the personal details of all authors in the title page in according to your suggestion.

7. Figures: The figure file should not include the title (e.g. Figure 1... etc.) or the figure number. The legend and title should be part of the manuscript file, given after the reference list.

We have changed it according your suggestion.

Referees. Comments to author:

Referee: 1
Comments to the Author

Are the methods appropriate and well described?

In general yes, but in my opinion it is necessary that the authors give to the readers:

a) some characteristics of the hospital that they mention (A, B, C, D, E). It is necessary to give an idea that contribute to understand the differences between hospitals B and D with respect to the rest; b) What mechanisms did they used to validity the information about contact tracing done, by the community health workers.

a) Hospital of diagnosis: all hospitals had diagnostic services and performed patient monitoring, but hospitals B and D had no contact tracing team and these were refered to their respective GP.

b) The mechanisms used to validate the ACS information contact tracing performed were: weekly meetings with the team of public health nursing, ongoing monitoring of program coordinator with each ACS and monthly meetings with experts from DOTs.

Are the discussion and conclusions well balanced and adequately supported by the data?
Yes, but it is necessary that the authors specify the reasons of the following sentence (page 9, paragraph 3): “One study limitation was the variation in characteristics between both periods; an increase of cases between 25-39 years of age, from Latin America and India, Pakistan and from inner-city in the CHW group. We believe that these differences didn't affect the results…” Why not?

We believe that these differences didn't affect the results because the increase in the immigrant population may have worsened the contact tracing, however, the percentage of contacts done improved after the introduction of the CHW intervention.

Referee: 2
Comments to the Author

Major compulsory revisions

The abstract could be improved.

The abstract has been improved according to your suggestion.

I would not abbreviate contact tracing (here and throughout), as the term CT interrupts the flow of the text.

We made the change in the abstract and the full text.

Rather than use “hospital B” I would use a more descriptive term e.g. “a hospital without a TB service” or similar.

In the methods section (variables) defined diagnostic hospital.

Hospital of diagnosis: all hospitals had diagnostic services and performed patient monitoring, but hospitals B and D had no contact tracing team and these were referred to their respective GP.

The definition of effective contact tracing should be reconsidered. Some individuals do not have any contacts, and this is especially true of the homeless and those with mental illness. Others may have a large number of contacts but only some of these can be traced. The reason behind using 70% is presumably that of the WHO target for the diagnosis of TB. This should then be applied to the percentage of contacts who could be traced.

We have defined contact tracing in the methods section.

Contact tracing was defined as performed when at least one contact was traced for each TB patient. The smear-positive pulmonary TB were prioritised [12, 13]. Given the low coverage of contact tracing performed, observed in immigrant population in the pre-intervention period, our objective was to get the 70% of coverage in the intervention period with all cases that involved the ACS.

The number of community health workers employed should be given, with an estimate of their case load. This permits extrapolation of this study to other cities.
We have included the estimate of cases for all community health agent.

Five CHW were selected from each immigrant community and worked a specific number of hours per week according to the number of cases: Asia (Pakistan, India, Bangladesh), 12 hours (112 cases); North Africa (Morocco, Algeria, Tunisia and arab countries), 20 hours (70 cases); Sub-Saharan Africa, 12 hours (32 cases); China, 6 hours (22 cases) and Latin America, 20 hours (152 cases). They were also involved with reported cases from other countries.

The services provided by the different hospitals should be described in such a way as to be able to understand why hospitals B and D performed less well compared to the other hospitals.

Regarding factors associated with lack of contact tracing, the two specific hospitals which were identified deal with large numbers of immigrants, do not had the appropriate means to perform contact tracing and frequently referred patients to a family doctor for contact tracing.

The second paragraph of the discussion needs to be rewritten for clarity. Language skills may be more important than cultural barriers and access to health care can be limited by both and the health care services themselves. To mention “unknown residence” in the same context as HIV infection is confusing. Without an address it is unsurprising that contact tracing could not be performed – although a comment on the actions of the community health workers in contacting individuals outside the usual context of a residence might be helpful if this occurred.

We have rewritten the second paragraph:

Regarding factors associated with lack of contact tracing, the two specific hospitals which were identified deal with large numbers of immigrants, do not have the appropriate means to perform contact tracing and frequently referred patients to a family doctor for contact tracing. Countries of origin such as India, Pakistan, Maghreb and other non-Latin American countries were also associated with lack of contact tracing performed, possibly because the language skills and the cultural barriers that may influence patient’s behaviour in relation to TB. Other factors were homelessness and unknown residence. But with some cases (homelessness or had not known residence) CHW contacted by phone or directly in public dining rooms. In all forms of TB cases also were associated with lack of contact tracing: male, incarceration history, extrapulmonary TB and a normal CXR. Among the few number of patients with incarceration history, the percentage of those without contact tracing reach 78.8%, some of these patients were HIV-infected IDU. The risk factors found in our study are similar to those reported in other studies [19, 20]. It is important to note that the lack of intervention of CHW is associated with lack of contact tracing in all TB cases and in the sub-group of smear positive cases.

The tables should be clarified. The p-values for the age geographical area of origin differences need to be explained in the text (did the age or origin of immigrants change, so the p-value relates to the denominator and not the intervention? Both Table 1 and Table 3).
The tables have been clarified. We modified the first paragraph of the discussion:

There was a low contact tracing coverage within the immigrant population during the pre-intervention period. The main reason for that was that the TBPCP was not prepared to manage the large influx of immigrants that occurred during this period. Moreover, a considerable percentage of the immigrants came from high TB endemic countries and did not speak Spanish. This study shows that immigration is a dynamic phenomenon, in the second period there were fewer patients from North Africa and more young adults. We have also found a statistically significant increase in performed contact tracing among immigrants after the incorporation of CHW. This increase suggests that CHW contributed considerably to the improvement of the prevention activities, due to their communication with cases and their contacts by interpreting and mediating for clinical care and in the community.

The title of Table 2 needs to be changed to demonstrate that a comparison of the two periods is being made, otherwise the use of odds ratios for "yes/no" options does not make sense.

The titles of the table 2 and 3 has been changed:


Table 3. Multivariate analysis of pre-post community health workers intervention and of other factors predicting the failure to perform contact tracing among immigrants in all forms of tuberculosis. Barcelona 2000-2005.

The significant values in Table 3 require comment - were more individuals in one time period HIV+, with a history of prison?

We explained it in the first paragraph in the discussion section:

In all forms of TB cases also were associated with lack of contact tracing: male, incarceration history, extrapulmonary TB and a normal CXR. Among the few number of patients with incarceration history, the percentage of those without contact tracing reach 78.8%, some of these patients were HIV-infected IDU. The risk factors found in our study are similar to those reported in other studies [19, 20]. It is important to note that the lack of intervention of CHW is associated with lack of contact tracing in all TB cases and in the sub-group of smear positive cases.

Table 3 should add "Type of TB of index case".

We have added to Table 2: “Type of TB of index case”.

**Minor compulsory revisions**

The title could be more helpful to the reader, e.g. Community health workers improve contact tracing in immigrants in Barcelona.
We have changed the title:

“Community health workers improve contact tracing among immigrants with tuberculosis in Barcelona”.

**The second sentence of the background should begin “The incidence of TB…”**.

We have changed the sentence.

In the third sentence of the background, the term “South-Eastern Asia” is problematic for readers to relate this to the immigrants who were from India and Pakistan, rather than from China.

We have modified the text:

According to the WHO in 2009, 9.4 million of new TB cases were recorded, most of them in the South-Eastern Asia, African and Western Pacific regions (35%, 30% and 20%, respectively). In addition, 1.7 million people died of TB, 0.38 million of whom were HIV-infected.

**The figure of percentage increase in immigrants in paragraph 2 must be wrong, unless the population of Spain has fallen from 166 million to 46.7 million.**

We have modified the text:

In many European countries, immigration, particularly from high TB burden countries, has increased. In January 2010, 5.7 million of foreign-born persons were registered in Spain (12.2% of the total population), in 1999 were registered 748,953 (1.8% of the total population), this representing an increase of over three million people in eleven years [4]. These percentages have been even higher in large cities such as Barcelona or Madrid, where the immigrant population has reached 17.6% and 17.1%, respectively [5,6].

Third paragraph, 1st sentence: “…on TB in Barcelona”.
Third paragraph, 2nd sentence: “Barcelona TB Control Program”.

We have modified the texts in according to your suggestion.

The sentence “However CT was under 50% among immigrants” is difficult to understand and the third paragraph of the Background should be rewritten.

We have modified the text:

This demographic change has had an important impact on TB in Barcelona, provoking a slower decline in TB incidence [7]. The strategy adopted by the Barcelona TB Control
Program (TBPCP) in 1987, with public health nurses (PHN) to follow the patients and coordinate contact tracing achieved indicators of good control in later years. Until 2003 treatment completion of the native patients was over 85% and contact tracing among smear positive patients was over 88%; however for the immigrant population the contact tracing was under 50% during these years [8].

Results paragraph 1: “Almost half lived in an inner city, socioeconomically-deprived district”.

We have modified the texts in according to your suggestion.

The text needs to make clear that failure to trace contacts was associated with an index who had culture-negative or extra-pulmonary tuberculosis or had a normal chest x-ray (last paragraph of results).

We have modified the text in according to your suggestion.

Factors associated with failure to conduct contact tracing for all forms of TB include male, hospitals B and D, birthplace other than Latin American countries, unknown district of residence, incarceration history, homelessness, index who had culture-negative or extra-pulmonary TB or had a normal chest X-ray and no CHW intervention (Table 3).

Discussion – 2nd paragraph: “normal CXR” 4th paragraph – has “significantly affected the epidemiology of TB” “even to those who had no right of residence” Paragraph 6 – who were “from a different culture” ; “agents” for “actors”.

We have modified the texts in according to your suggestion.

Discussion, penultimate paragraph. The sentence “We believe that these differences didn’t affect the results”. This needs to be explained as above, noting that the increase in immigration should have worsened the coverage of contact tracing, so emphasizing that the improvement was real.

One study limitation was the variation in characteristics between both periods; an increase of cases between 25-39 years of age, from Latin America and India, Pakistan and from inner-city in the CHW group. We believe that these differences didn't affect the results because the increase in the immigrant population may have worsened the contact tracing, however, the percentage of contacts done improved after the introduction of the CHW intervention.

Conclusion. “approached in a familiar way” This sentence needs to be revised for clarity.

We conclude that TB programs in areas of high immigration can improve their effectiveness by the incorporation CHW who act in coordination with the PHN and other professionals. They would act as interpreters and inter-cultural mediators as well as undertake community actions which positively reinforce the response from patients,
as seen in the improvements in contact tracing. This is possible when immigrant people have confidence, both linguistically and culturally, is the response of any human being when you feel welcomed and accompanied. The findings of this study encourage us to strengthen the interdisciplinary work by CHW.

**Use English in the figures.**

According to your suggestion, we have used English in the figures.

**Discretionary revisions**

Delete “notably to become a highly relevant socio-demographic phenomenon” in paragraph 2 of the background.

We have deleted the phrase of the background.