Author's response to reviews

Title: Tuberculosis and homelessness in Montreal: A retrospective cohort study

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To the editors of *BMC Public Health*,

RE: Tuberculosis and homelessness in Montreal: a retrospective cohort study
(Manuscript ID 1062935294574725)

Many thanks to the editors of *BMC Public Health* and to the reviewers for their thoughtful comments. Please find our responses to the reviewers’ comments below.

We hope that these revisions will prove satisfactory, and look forward to your response.

Sincerely,

Jason Tan de Bibiana
Kevin Schwartzman

On behalf of all study authors
Response to Reviewer 1

Reviewer: Kamran Khan

Reviewer's report:

Overall this is a well done descriptive study of homelessness and TB in Montreal over the span of more than a decade. It includes clinical information, microbiological data and molecular fingerprinting data which adds to its interest. The small sample size of just 20 homeless patients limits the lessons that can be learned, but the comparison to non-homeless individuals offers an interesting perspective. Some specific comments have been included as suggestions.

Page 8 – “and applied a non-parametric test to compare medians of continuous variables.” Which test is this exactly?

We have indicated the specific test used (a non-parametric K-sample test on the equality of medians, STATA 8.0)

Page 9 – “While only 292/1803 (16%) of non-homeless patients were born in Canada, 17/20 (85%) homeless TB patients were Canadian-born (OR=28, 95% CI: 8.1-96)” Might it be clearer to indicate that 84% of non-homeless patients were foreign born, while 85% of homeless TB patients were Canadian born? The comparison here (if accurately stated) more readily demonstrates that significance of the contrast between the two groups.

We have changed the text as suggested.

Page 10 – “All 20 homeless patients had pulmonary TB, of whom 17 (85%) had smear-positive disease (OR=5.7, 95% CI: 1.7-20).” Do you know how smear positive they were? i.e. numerous, few etc?

The public health data we used do not record semi-quantitative smear results (i.e. 1+, 2+ etc.); smear results are only reported as a dichotomous variable i.e. positive/negative.

“The largest cluster (12 cases) included 8 homeless patients and 4 others, spanning 11 years. Three smaller clusters included 6 (1 homeless plus 5 others), 6 (1 plus 5) and 2 patients (1 - and 1) respectively. It might be worth using the words homeless and others in all parentheses for clarity.

Reworded as suggested.

General comments – homeless persons and homeless patients are used interchangeably. Consistency with one term would be preferable.
We have changed “homeless patients” to “homeless persons” and “homeless persons with TB” as suggested.

Was HIV testing done in all patients? This is a challenge in many studies because the denominators of HIV tested patients are often much smaller than the total sample size of the population (i.e. the HIV status of many individuals is unknown even though they were confirmed to have active TB).

No, HIV testing was not done for all persons with TB; a higher percentage of homeless persons with TB were tested. We have added “Tested for HIV” to Table 1 and the following sentence to the Results section (p.10):

Of those tested for HIV, 12/17 (71%) homeless persons with TB were HIV-positive, vs. 130/883 (15%) non-homeless persons with TB (OR=14, 95% CI: 4.8-40)


Done: corrected reference (JAMA 1996)

The authors might want to compare their findings with a recent EID study of homelessness and TB in Toronto over 10 years to highlight any significant similarities or differences.

http://www.cdc.gov/eid/content/17/3/357.htm

We have added the following text to the discussion (p.14), to compare findings from the recent EID study and extend our discussion of TB among homeless persons in Toronto. We highlighted the higher proportion of foreign-born homeless persons with TB in Toronto.

“While Toronto’s population (2.5 million) is roughly 30% greater than Montreal’s (1.9 million), Toronto also reported more than four times the number of homeless persons with TB (91 persons) during a time frame similar to that of our study (23). The reasons for this difference are not entirely clear, but contributing factors likely included 1) extensive transmission (documented by M. tuberculosis genotyping), likely reflecting the high prevalence of heavily smear-positive, cavitary disease; and 2) an increasing proportion of foreign-born persons (notably those from high TB incidence countries) among homeless persons with TB in Toronto. By 2003-2007, 39% of the Toronto homeless persons diagnosed with active TB were foreign-born. If, more generally, foreign-born persons from high TB incidence countries account for a growing proportion of the homeless population, this would result in a larger reservoir of latent TB infection.
In Montreal, only three of the 20 homeless persons with TB were foreign-born and there was more limited evidence of ongoing transmission.”

Figure 2 and Figure 4 – the symbology on the maps to the left are difficult to see – perhaps they could be shown as an inset map highlighting the area of interest while the more detailed maps to the right could become larger allowing the symbols to be viewed more easily.

We revised Figure 2 and Figure 4 as suggested by shrinking the “island maps” into the corner as an inset. However, we also elected to remove the street grid from the detailed maps due to concerns about confidentiality.
Response to Reviewer 2

Reviewer: Nobukatsu Ishikawa

Reviewer's report:

Review comments by Nobukatsu Ishikawa

“Tuberculosis and homelessness in Montreal: a retrospective cohort study”

Major revisions:

Abstract

1. “ten potential locations” in the lines 7 and 8 under Results part on page 4 need to be more clearly and concretely described what they mean.

We have rephrased the text as suggested to clarify the use of GIS and characterization of locations.

Background

1. The population in Montreal, the estimated annual TB incidence or TB notifications among homeless people should be described either in the Background part or in the Study setting of the Methods part.

We added a sentence to Study setting (p.7) mentioning the most recent estimate of TB incidence for Montreal in the overall population.

2. “the broader population” in line 1 under Background part on page 7 needs to be described more explicitly.

Rephrased as “non-homeless population.”

Methods

1. Study design is not clearly mentioned although the title implies it is a cohort study. The study design needs to be described explicitly in the Methods part.

Done: We have added the following sentence to the first paragraph of the Methods subsection on data collection and analysis (p.7):

“Our study used a retrospective, population-based cohort design.”

2. “a non-parametric test” in line 3 on page 8 needs to be specifically described
indicating what kind of non-parametric test was applied in the present study context.

Done: please see response to reviewer #1, i.e. a non-parametric K-sample test on the equality of medians.

3. The process of geo-coding for the homeless people should be further described in detail in the Geo-coding and mapping part on page 9. What kind of addresses or locations of the homeless people were encoded for this study, i.e., the addresses the homeless people stay at night, the addresses the homeless people in day time, and so forth?

We abstracted all home, work/school and social locations documented in public health records. For the homeless group reported here, the various types of locations are described in detail in the Results section.

4. “What kind of analysis was applied by using the Arc GIS to do what?” needs to be described clearly in the Geo-coding and mapping part on page 9.

Arc GIS was used in our study primarily as a data management tool, to systematically store and display spatial data, and to help identify and keep track of shared locations. This was necessary given the large number of locations identified in public health records. As we were focused on shared specific locations, rather than their proximity, we did not look for statistical evidence of spatial clustering. In addition, the latter would not have been particularly helpful since the homeless shelters, and related services, are already well known to be located close together, in a small part of the city’s downtown core.

5. No analysis was conducted for epidemiological survey to investigate the contact history among those who shared genotyping patterns? If yes, describe what kind of data were used and how were they analyzed in Methods part.

We did abstract data describing the results of contact investigations for the 20 homeless persons with TB from public health records.

We have added the following sentence to the Methods section (p.7):

“We also reviewed public health records to abstract the results of contact investigations and descriptions of locations associated with cases.”

We have added the following section “Results of contact investigations” to the Results (p.10). Here we have added details about the contacts identified for the 20 homeless persons with TB and noted that only 2 of the 20 homeless persons with TB were identified by public health authorities through contact investigations:
“For the 20 homeless persons with TB, there were a total of 345 contacts identified and investigated by public health personnel; 183 (53%) were shelter users or employees. Of these 345 contacts, 156 (45%) underwent tuberculin skin testing (TST). Of those tested, 53 were TST positive, and 18 were prescribed isoniazid for latent TB infection.

Two of the 20 homeless persons with active TB were identified by public health authorities as contacts of a non-homeless person with TB who attended an Aboriginal community centre. One of these homeless individuals had an \textit{M. tuberculosis} genotype that matched that of the initial case, while the other had a distinct \textit{M. tuberculosis} genotype. There were two other non-homeless persons with active TB (one distinct, one matching the initial case by genotyping) who also attended the Aboriginal community centre, for a total of 5 cases of active TB identified in a 1-year period among individuals who frequented the community centre. Further information on genotyping and sharing of locations is provided below. None of the other 18 homeless persons with active TB were prospectively identified by public health authorities through contact investigations.”

Lastly, we have also added the following to the Discussion (p.17):

“A formal social network analysis was beyond the scope of this manuscript. However, the limits of investigation based on named contacts have been well recognized in the context of homeless and other marginalized populations, which was why we elected to focus on named locations rather than named individuals.”

Results

1. Are all 20 homeless TB patients mentioned in the incidence of TB part culture positive or all forms of TB? It seems to be all forms of TB patients as described in the following next part. But it says all of them are culture positive patients in Genotyping results part. All of the homeless TB patients identified are culture positive pulmonary TB patients? No culture negative pulmonary TB patients are identified? No extra-pulmonary TB patients, either?

As indicated in our results section, all 20 had culture-positive pulmonary disease. We have added a sentence to indicate that two had concomitant extrapulmonary TB.

2. The terms of “smoking”, “alcohol use”, and “drug use”, which appear in the last sentence in the “Demographic and clinical characteristics of homeless patients” part, have not been defined anywhere in the manuscript. The terms need to be defined in advance somewhere in Methods part.

These were based on public health records; for our analysis, all of these denoted current use of tobacco, alcohol, or street drugs respectively. There was no definition based on minimum quantity or frequency of consumption. We have added the following sentence to the Methods section (p. 8, Data collection and analysis subheading):
“Subjects were characterized as users of tobacco, alcohol, and/or street drugs based on current use as documented in public health records, without a requirement for minimum frequency or quantity of consumption.”

3. The possible transmission route and locations were described from 20 homeless TB patients, not both from the homeless and from the non-homeless. It is better to describe the possible transmission route and locations from all those who belong to the clusters irrespective of the homeless status because it is possible to have common transmission between the homeless and the non-homeless (i.e., general people) who share the genotyping patterns. The authors are requested to describe the possible transmission route and locations from this point.

We performed and reported an analysis of ALL locations and potential transmission involving homeless individuals, regardless of whether locations and/or M. tuberculosis genotypes were shared with other homeless or with non-homeless persons. We did not restrict this analysis according to potential source (i.e. we examined potential transmission TO as well as FROM homeless persons). The Results section therefore reports and describes all locations shared by two or more persons, including at least one homeless person. On the other hand, a detailed analysis of locations listed only for non-homeless persons would detract from the focus of this manuscript. More general analyses of locations for potential TB transmission in Montreal, which excluded homeless persons (as they focused on residential, workplace and school transmission) have previously been published; see Wanyeki et al, Soc Sci Med 2006; 63:501-511; Haase et al, Int J Tuberc Lung Dis, 2007; 11:632-638; Carter et al, Health & Place, 2009; 15:777-783.

Discussion

1. The authors are requested to further discuss about the impact of high possibility of the on-going transmission among homeless people to general people, which is briefly described in lines 7 through 9 under Discussion part on page 13. The paper listed below may help to discuss further about it.


We now refer to this study in our discussion of interrupting ongoing transmission among homeless persons and between homeless persons and non-homeless persons as a priority for public health intervention.

2. Recognizing the possible transmission route and locations among homeless TB patients in Montreal, do you recommend any interventions as suggested in line 3 through 5 on page 15 in addition to strengthening further infection control measures in hospital setting? If so, describe them.
We have added further emphasis on possible improvements to the management of latent tuberculosis infection in this context, including the potential use of directly observed preventive therapy using the three-month regimen of weekly isoniazid and rifapentine.

Minor revisions:

Abstract

1. The abbreviated words such as RFLP in Methods part and OR, CI in Results part need to be fully spelled out whenever they appear first time.
2. “from 1996-2007” in the line 2 and 6 on page 4 should read as “from 1996 to 2007”.

Done as suggested.

Background

1. “may frequent crowded” in the line 8 under Background part should read as “may be frequently crowded”.
2. “poorly ventilated physical environments” in the line 9 under Background part should be rephrased for it’s not clear what it means.

Sentence changed to: “Homeless persons may congregate in crowded and poorly ventilated buildings, such as dormitories and shelters.”

Methods

1. “Mycobacterium tuberculosis” in line 5 under Study setting on page 7 should read as “Mycobacterium tuberculosis (M. tuberculosis)”.

Done as suggested.

2. “Mycobacterium tuberculosis” in line 7 on page 8 should read as “M. tuberculosis” for this word has already appeared.

Done as suggested.

3. A title like “Ethical consideration” should be put between the first and the second phrases on page 9 to make the manuscript style consistent.

Done as suggested.

Results

1. “from January 1, 1996 – September 11, 2007 ” in line 11 on page 9 under Results part should read as “from January 1, 1996 to September 11, 2007”
mentioned above

Done as suggested.