Author's response to reviews

Title: Socioeconomic status and environmental noise exposure in Montreal, Canada

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Author's response to reviews: see over
Montréal, February 6, 2015

Dear Dr. Cameron

On behalf of all the co-authors, I would like to thank you for the review of our revised manuscript entitled “Socioeconomic status and environmental noise exposure in Montreal, Canada” (1571463475144453).

Thank you for giving us the opportunity to respond to additional comments. We have prepared a point-by-point response, including a clear description of the changes.

We hope it will find your approval. Do not hesitate to contact me if you have any further questions.

Sincerely yours,

Audrey Smargiassi
Point-to-point response
“Socioeconomic status and environmental noise exposure in Montreal, Canada”
(1571463475144453).

1. In the abstract it would be preferable not to refer to "dissemination areas" - this appears to be a Statistics Canada sampling term and I suspect will not be widely understood outside of Canada.

   We totally agree and thus replaced the term “dissemination areas” by “small geographic scale” in the Abstract. The sentence now reads as follows:

   “Indicators of socioeconomic status were correlated with LAeq24h noise levels estimated with a land-use regression model at a small geographic scale.”

2. A description of the concept of deprivation is provided in the introduction (beginning on line 52). Given that deprivation is always a relative concept, it may be preferable to refer to relative deprivation rather than deprivation per se in the introduction.

   As suggested, we revised the wording for the concept of deprivation in the introduction as follows:

   “Deprivation is defined as “a state of observable and demonstrable disadvantage relative to the local community or the wider society or nation to which an individual, family or group belongs” [6]. Also, Townsend [6] describes two main forms of “relative” deprivation. The first, “relative” material deprivation refers to a deficiency of fundamental goods and conveniences such as a safe place to live, an adequate diet, and basic amenities. The second, “relative” social deprivation refers to a lack of adequate social relationships with members of one’s family, community, or workplace. While each form of “relative” deprivation may have its own public health implication, socioeconomic status is often used as an indicator of “relative” deprivation.”

3. Although a number of indicators of socioeconomic position have been used here, on their own, each are imperfect indicators. It would be interesting to know whether Statistics Canada produces a composite indicator that may be more holistic and useful. An example of such an indicator is the SEIFA indices used in Australia (http://www.abs.gov.au/websitedbs/censushome.nsf/home/seifa). If none exist, this could be included as a limitation.

   Statistics Canada does not produce such a composite indicator. However, the National Institute of Public Health in Quebec (INSPQ) does create an index of material and social deprivation (http://www2.inspq.qc.ca/santescope/documents/Guide_Metho_Indice_defavo_Sept_2010_A.pdf). The indicator is built from six socioeconomic indicators that have a known relationship to health status.

   Thus, as suggested by the editor, we added these indicators and computed the Pearson correlation coefficients with noise levels. The method was modified by adding the following sentence:
“Furthermore, two indicators combining several socio-economic variables and developed by Pampalon and Raymond [20] were used, 7) the material deprivation index and 8) the social deprivation index.”

We added these two indicators to Table 1 and Figure S1 in the Supplement Material. We also slightly modified to mention the additional results.

4. Please state what p-value is for in Table 1 in a footnote (presumably the association with noise levels?).

Thank you for giving us the opportunity to clarify this. The p-value in Table 1 refers to the Pearson correlation between the dissemination area variables and the LAeq24h. We made sure that it is clear in the revised version.

5. Please report on what the numbers represent in Table 2 (dissemination areas presumably?)

Yes, the numbers in the cross-table (Table 2) refer to the number of dissemination areas by quintiles of median household income and average LAeq24h noise levels. We revised the title of the table to clarify this:

“Number of dissemination areas by quintiles of median household income and average noise levels (LAeq24h), Montreal, 2006.”

6. The revised beginning of the introduction refers to the health effects of noise, however annoyance and sleep disturbance are not in themselves health effects (they are perhaps risk factors for health conditions), and cardiovascular effects is an imprecise term (should be cardiovascular diseases). Furthermore, when looking at the abstract of the referenced Lancet paper, a number of other health effects and health-related issues arising from environmental noise were mentioned (incidence of hypertension and cardiovascular disease, cognitive performance, patient outcomes and hospital staff performance). This paragraph might be improved with a more thorough description of these health and non-health effects.

We modified the first paragraph of the introduction as follows. However, we chose to keep the information on noise-related effects short as it is not the aim of the manuscript.

“Chronic exposure to noise has been linked to various adverse effects such as annoyance, sleep disturbance, impaired cognitive performance, as well as to the onset of cardiovascular diseases”

7. In the comparison of Montreal with Western European cities, it is mentioned that poverty is concentrated in the centre of the island. Poverty is quite a different concept to deprivation. It can often be difficult to get an accurate idea of the spatial distribution of socioeconomic position since in inner city areas, very wealthy individuals and very poor individuals can be co-located (poorer people in high-rise flats etc., the wealthy in houses). Since this issue is at the heart of the paper, it may be worth exploring further in the text to report on any nuances such as this that are present in Montreal.
Is it true that in Montreal, like in other European cities, very wealthy and poor people live in the center of the city. However, on the basis of all the dissemination areas, the proportion of residents with low socioeconomic status is higher in the dissemination areas in the center, compared to other areas on the island of Montreal. This may be related to the higher density of less expensive housing options in the city center. To avoid any misunderstandings, we replaced the word “poverty” with “the proportion of people with a low socioeconomic status”:

“Indeed the inner city in Western Europe is often wealthier than the suburbs whereas in Montreal, the proportion of people with a low socioeconomic status is higher in the center of the Island, where higher noise levels can be found.”

Furthermore, we added the following sentence to the 10th paragraph of the discussion to address the fact that our assessment of the spatial distribution of the socioeconomic position is imperfect:

“Furthermore, our assessment of the spatial distribution of the socioeconomic position is imperfect as we used aggregated socioeconomic indicators at the dissemination area level. Small-scale spatial variations of the socioeconomic status within a dissemination area may not be detected. It is indeed worth noting that concentrated pockets of individuals with low socioeconomic status are generally small in Montreal, rarely covering an entire dissemination area [28].”