Reviewer's report

Title: Road Traffic Noise Frequency and Prevalent Hypertension in Taichung, Taiwan: A Cross-Sectional Study

Version: 1 Date: 8 January 2014

Reviewer: Anna Hansell

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General comments
This is one of the first studies to look at frequency components of road traffic noise and health outcomes. Major flaws in design are that the study only included self-reported hypertension, it measured noise on weekday daytime when many if not most of the respondents are likely to have been elsewhere at work and also it was not clear if those with hypertension diagnosed prior to moving to current residence were excluded. While there is a generally good discussion of study limitations, the latter two issues are not discussed in the paper. I am also concerned that analyses did not take into account either total noise or total traffic flow – or at least investigate relationships between total noise/flow and different frequency noise.

Major compulsory revisions except where otherwise stated

Introduction
1. This should state that the association with total noise has been assessed and published in a previous paper and that this study goes on to examine associations with specific noise frequencies.

Methods
2. Was more than one person per household recruited? If yes, did the analysis allow for clustering by household?

3. Did the study take account of how long people had lived at current residence and whether hypertension was diagnosed while living at current residence? If information is available, only those diagnosed at current household should be included.

4. What were correlations like between low, medium and high frequencies? Were those exposed to high values exposed to high values of noise at any frequency?

5. Could the authors please elaborate on the rationale for the method chosen for statistical analysis. Why divide into high/low noise exposure groups – why not use continuous or a transformed value for continuous noise? And why not consider adjusting for total noise or total traffic volumes – exposure to high levels of low frequency noise may be a marker of traffic exposure rather than specific to low frequency noise. Also, statistical analyses that have been done could be described more clearly e.g. ‘For each of the nine frequencies of noise considered
from 31.5 Hz to 8000 Hz, the odds ratio of self-reported hypertension in those above vs. below the median exposure were calculated”.

6. Page 7 ‘simple logistic regression models’ – it is not clear what is in these models. It is obvious from Table 1 that these factors need to be included as statistically significant there.

7. Page 7 – the multiple logistic regression equation sentences do not add anything to the paper and could be omitted as this is a standard method (from “The multiple logistic regression can be expressed…..to….for the ith X variable”).

(discretionary revision)

8. Page 9 Use of the Bonferroni correction is debated and other methods are available. In the situation of male/female analyses where the Bonferroni correction is presented in this paper, I would be happier instead with presentation of with formal tests for interaction by sex – I suspect these would be non-significant as the dataset is not large and one will lose power by dividing into male and female. If the Bonferroni correction is used, then the number of comparisons needs to be stated. The number chosen is debatable here as it could include all comparisons made in all analyses and potentially the correction would need to be applied to all results. I would prefer it not to be used at all – there is already a good comment in the discussion about multiple comparisons.

Results

9. Table 2 – the size of the correlation is important here as well as statistical significance and should be stated. My interpretation of table 2 is as follows. All types of road vehicles including motor cycles were statistically significantly but moderately correlated (rho=0.3 to 0.6) with low frequency noise and with the 250Hz band of medium frequency. Only motorcycles were also statistically significantly correlated with high frequency noise, again with moderate values of rho.

10. Table 3 – I am confused by ‘Median (Q1-Q3)’. Firstly why not just median, secondly is this Q1 to Q3 or Q1 minus Q3.

11. Could the noise distributions be presented on an online appendix? (discretionary revision)

12. Page 9. It is not clear whether the p-values for increasing trend were for ‘total’ or for male and female separately. Please could the p value for trend for total, male and female be added to the figures.

Discussion

13. Page 11 Authors need to clarify that the OR of 2.15 for all frequencies comes from a previous published analysis – this was not readily apparent on first reading.

14. There is a generally good discussion of potential bias from using diagnosed hypertension and other limitations such as lack of adjustment for SES. However, there is also bias from only using daytime weekday measurements, which is potentially problematic given that the mean age suggested most are adults at work therefore are not likely to be exposed. This should be stated early on in the
limitations section.

15. This important exposure misclassification bias (above) and the bias from using diagnosed hypertension only should be included in the abstract.

Layout of figures and tables (Minor essential revisions)

16. Table 1. Specify that case means previous diagnosis of hypertension

17. Figures – please could the x-axis categories be better separated with extra space between each frequency grouping and the male/female/total results within each category be plotted closer together. Currently these look continuous at first glance.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests