

## **Reviewer's report**

**Title:** Investigating health effects in a community surrounding a road tunnel stack  
- A cross sectional study

**Version:** 1 **Date:** 4 June 2008

**Reviewer:** Craig Hansen

### **Reviewer's report:**

Major compulsory revisions

1. Background (Page 3, Para 1, Line 6): It is assumed that the community concerns are related to the Sydney tunnel, if so, the sentence should state that the community concerns are among residents in Sydney, otherwise it is a general statement without a reference.

2. Background (Page 3, Para 2): These few sentences attempt to introduce the reader to the topic of 'environmental perception' and the 'health effects' associated with living near point sources but it is a little vague. There is mention that the health effects were similar within these studies, but what about 'environmental perception', was it similar and was it linked to the symptoms? There needs to be a sentence or two that introduces the reader to the potential link between 'environmental perception' and 'health effects' (e.g. have any studies found that people's perception of environmental hazards is associated with various symptoms). It also needs to mention why is it important to investigate these endpoints together within a study like this? There also needs to be a sentence or two that introduces the 'health effects' associated with proximity to traffic related air pollution – there needs to be rationale as to why these health effects were investigated (this is briefly done at the end of page 4).

3. Methods: Following on from point 2, it states that a panel of physicians decided whether particular symptoms would be 'likely', 'uncertain', or 'unlikely' to be related to the M5 stack. Given that respiratory health is a major endpoint examined in a large percentage of the air pollution literature, particularly in relation to traffic related pollutants, it is odd that respiratory symptoms were not chosen as one of the endpoints to be examined. The rationale for the chosen endpoints needs to be explained in a little more detail.

4. Methods (Page 6, Para 2): The sentences explaining the exposure assessment are a little vague. Here are some points that could be expanded on.

a. What are 'intunnel' stack emissions data – briefly explain these emissions.

b. Was ambient NO<sub>x</sub> also from the air quality monitoring stations as the sentence sounds like only the meteorological data were from the air quality stations – this needs to be clearer?

c. What is the spatial resolution for the TAPM (e.g. 1km grids). A sentence

should briefly explain what the TAPM does (e.g. incorporates wind speed and direction etc).

5. Methods: How were the exposure cut-points derived (e.g. tertiles)? This needs to be explained.

6. Methods: A few points regarding the administration of the telephone survey that should be stated/discussed.

a. Were the study participants informed that it was a study focusing on the M5 tunnel, or were they told it was a general health survey across Sydney – could this alter the results in anyway, particularly the link between the environmental worry and symptoms?

b. How was random sampling of one household member undertaken? Or was the selection based on whoever was available in the household at that time, or the household members decided who should be the household participant?

c. What time of the day, and what day of the week, was the telephone interview administered and could that possibly influence the chosen household member.

7. Methods (Page 10, last sentence): Define 'environmental worry' (e.g. how many categories, a scale from 1-10 etc). It is in the results but a sentence is required in the methods that briefly explains the development of the categories – not just saying that it was adapted from Lipscomb and Shusterman. Considering that environmental worry is a main result and discussion point.

8. Results (Page 12, Para 2): It states that subjects 'living closer' to the M5 stack were more likely to be aware of the stack. That should state subjects 'in the high exposure zone' as the zones are based on modeled emissions data and not the distance to the stack.

#### Minor essential revisions

1. Background (Page 3, last sentence): Provide a reference for the '82 000 vehicles daily'.

2. Background (Page 5): This sentence needs to be clearer and state that this is a new study that investigates the symptoms that had been identified in the earlier qualitative study. It first reads as if this paper is presenting the results from the earlier study.

3. Methods/Discussion: Is it necessary to include information on the originally defined exposure zones that are based on the yearly average when they are not actually used for the final analyses. Both the defined and re-defined exposure zones are presented for comparison purposes, yet there is very little comparison. How much would have the results differed if the original exposure zones were analysed and compared? However, why the stratified sampling was not based on the re-defined exposure zones from the start is unclear. Furthermore, by assigning the exposure zones based on data for the short period of the study assumes that the symptoms investigated are short term when in fact they may be chronic. Should this be discussed?.

4. Methods: Briefly explain how the households were assigned to the exposure zones based on geocoding (e.g. what if the polygon boundary for the exposure zone went through the house).

5. Methods: Explain why current asthma was assessed as a potential effect modifier and asthma symptoms were not examined as a health outcome.

6. Discussion (Page 14, Para 2): Distance to the stack was not considered as a measure of exposure due to the complex nature of the topography of the area. If that is the case, does the TAPM take into consideration the topography of an area as it is assumed that the 'complex nature' relates to various valleys where pollutants may lay dormant for longer periods due to lack of wind.

7. Discussion (Page 15, last sentence): The 'teeth and gums' symptoms need to be mentioned in the methods, especially if the purpose of examining those symptoms was to test for measurement bias. It would be interesting to know if the 'teeth and gum' symptoms were associated with any of the other symptoms examined?

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

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