

## Reviewer's report

**Title:** Near-highway exposure to motor vehicle pollutants: Emerging evidence of cardiac and pulmonary health risks

**Version:** 2 **Date:** 30 January 2007

**Reviewer:** Gregory Howard

### Reviewer's report:

General

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

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Discretionary Revisions (which the author can choose to ignore)

1. In page 3 para 2 you define UFP as 0.01-0.2  $\mu\text{m}$ , but others often refer to 0.1  $\mu\text{m}$  as upper limit, e.g. Zhu 2002. In this same paragraph, "Pollutant levels decrease... due to dilution", there are other forces at work including coagulation and settling, although less important.
2. Reference to Roorda-Knape et al at top of p 5 should be (9), not (1998).
3. The Roorda-Knape study found correlation of indoor black smoke with truck traffic, but do not specifically say "diesel" trucks. Consider removing the word "diesel" in p 5 para 1.
4. In summary paragraph on p 5, it's not clear where the 30 m number comes from, although it seems a reasonable choice. A reminder here that particle size distribution is dependent on distance, leading to risks which may not vary smoothly (or even monotonically) with distance, might be helpful.
5. You cite reference (16) for effects on HRV on p 5. In fact, that study found a specific effect of black smoke, which is probably a better indicator of a traffic source than PM<sub>2.5</sub>, and makes your case more strongly.
6. Reference to Hoek (24) on p 6: "cardiopulmonary mortality was associated with both pollutants and living near a major road." This is a bit of an oversimplification of the analysis, which found an association with living near a major road and with modeled, but not measured, levels of pollutants based on location near a major road, and less strong findings for background levels of both pollutants. This could be clarified.
7. Asthma studies p 7 para 1: You should probably reference English 1999 EHP 107(9):761. English found no impact on asthma prevalence but some impact on number of increased number of medical care visits. (You don't discuss exacerbation of existing asthma by air pollution, although some data is available.)
8. Reference to (43) on p 7: "risk is higher for children who moved next to the highway before they were 2 years of age." In fact, the study found a result only for those children, and no result for "short-term" children. This should be made clearer.
9. Pediatric lung function, p 8: You may want to add a reference Gauderman WJ in Lancet 2007 (in which case I would add "reduced lung function development" to the abstract). Gauderman found larger effects in boys than in girls, in contrast to (54).
10. Reference to (73) on p 10: "at the level of the home"? This phrasing is a bit unclear.
11. You do not mention lung cancer in the first paragraph of the "policy and research recommendations"

section on p 11, but it is probably worth reiterating that many of the studies reviewed in the lung cancer literature are less relevant to highways per se, being based on pollutants like PM, O3, and SO2.

12. A clear research gap in my opinion is the somewhat random choice of exposures at home or at school, always neglecting the other exposure. Attempts to integrate total exposure to major highways would help reduce exposure misclassification. Commutes are an obvious source of highway exposure. Day care might be another, especially in light of McConnell's (43) findings only in children exposed at ages less than 2.

13. Conclusions, p 12: A mention of the problem of SES, both as a likely confounder and as an environmental justice issue, would be welcome here.

14. 10% or more of the population of the US may live in mobile "hot spots": Reference?

15. Abbreviations list: add SES, PEFR, FVC

16. Reference (47) should be "spatial" (not "special").

**What next?:** Accept after discretionary revisions

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

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