Reviewer's report

Title: Used vacuum cleaner bags vs. the high-volume surface sampler for collection of carpet dust samples in epidemiologic studies of children

Version: 1 Date: 15 October 2007

Reviewer: Ruthann Rudel

Reviewer's report:

General
A relatively clearly presented description of a simple and important methods comparison. The evaluation of effect of random error on relative risk estimates is novel and interesting.

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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)

1. The last sentence of the abstract was unclear. I would suggest "... the extent to which the vacuum bag method will reduce relative risk estimates by increasing random measurement error will vary by compound ..."

2. Statistical analysis. It appears the analyses of HVS3 data were conducted using the mass chemical per gram dust, rather than the mass per surface area sampled. Did the authors also evaluate rank correlation between the HVS3 and vacuum bags using surface area- rather than mass-based concentrations for the HVS3 data? If so, it would be interesting to know the outcome. If not, perhaps they could explain why not.

3. Statistical analysis, and p.20. Sometimes correlation estimates can be influenced by treatment of below detection limit values (see for example Newton and Rudel. (2007). Estimating correlation with multiply censored data. Environmental Science & Technology. 41:221-228). Authors should review scatter plots of each correlation to assess how <DL values are affecting correlation estimates. Authors might consider using an alternative correlation estimator - Kendall's tau, adjusted for ties (see Newton and Rudel 2007 for a description and additional references).

4. Page 18 and elsewhere, I suggest using quotation marks around the term "gold standard" to indicate that the assignment of HVS3 to this status is hypothetical. I think it is important for the authors to elaborate on this issue in text as well. For example, it is important for readers to keep in mind that the real "gold standard"
standard" is the measure most predictive of the exposure of interest in a particular study. It is possible that vacuum bag would be better than HVS3 because it integrates more of the house, for example, of perhaps some combination of the two is most predictive.

5. Conclusion: The 2 sentence conclusion is unclear. The introduction of dust loading issues at this point in the paper lacks context and meaning. Please clarify.

Discretionary Revisions (which the author can choose to ignore)

Page 6, The paper says the HVS3 collects particles > 5 microns. It would be interesting to know a) whether there is also a high-end cutoff (other than the 100-mesh sieve in the laboratory sample preparation) and b) whether/how the distribution of particle sizes differs between the two methods (David Camann at SWRI may have some of this information).

Page 9, The paper says 150 homes were sampled using both methods. Have any chemicals been analyzed in both samples in all 150 homes? If not, what was the purpose of collecting those samples? Some context would be informative.

Methods section - the description of analytical methods is very detailed. Is this the first report of these methods, or could other papers be referenced and the description condensed?

What next?: Accept after minor essential revisions

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

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.