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:** 2 October 2007

**Reviewer:** Joseph Allen

**Reviewer's report:**

REPORT

-----------------

Confidential comments to editors

-----------------------------

None

Reviewer's report

-----------------

The findings in this paper have wide-ranging implications for exposure assessment concerning several different metals and classes of compounds. I am happy to support publication of this paper, subject to careful review of the concerns addressed in 'Minor Essential Revisions'. The comments have less to do with the quality of the work but more about the presentation that could affect interpretation of these important findings.

- **Major Compulsory Revisions**

  None

- **Minor Essential Revisions**

  MANUSCRIPT

  **Background**

  1) Page 6 - 7

  References 15 & 16 (and the preceding sentence) refer to surface loading being a better indicator of dose than concentration...for lead. Does this hold true for PCBs and the other compounds in this study? If so, need to add a reference. If not, add clarifying sentence or statement (eg. ‘There is some evidence that loading is a better indicator of dose than is concentration for some metals; in studies of…”)

  2) Page 8
“In addition, because children spend most of their ‘floor’ time in one room…”

Not sure this is true. Need to add reference.

METHODS

1) Page 9

Please describe the method for choosing 45 of the 150 households with available HSV3 and ‘used bag’ samples. The only exclusion criteria listed was for insufficient dust but that isn’t likely to have been the sole reason for excluding over 2/3 of the sample. The results of this study are strong but rely on the 45 homes being representative of a random sample and not selected because they had a higher percent agreement.

2) Page 9

“We ruled out households…”

Need clarifying statement here – were homes ruled out more often for insufficient dust from the HSV3 or used bag? If it was consistently because the used bag did not have sufficient dust, this would have implications for how well the used bag method could work in actual epidemiologic settings.

3) Page 11

Provide more detail on how the 1 sq. meter area was chose (eg. center of room? Standardized selection? Excluded area near doorways?)

4) Page 11

The goal of the paper was to compare HSV3 with used bag methods. On Page 8, the authors state that, in practice, rarely is the HSV3 used in more than one room. However, in the methods section the authors describe using the HSV3 in more than one room to collect the necessary dust. This gives the impression that the conclusions being drawn about the efficacy of using the used bag compared with HSV3 may not be valid; the comparison being done is using an HSV3 method that more closely resembles the used bag method in that it is used in more than one room, contrary to how the HSV3 is normally used in practice. The authors need to address this issue.

5) Statistical Analysis, Page 16

Please justify substituting ½ the detection limit for compounds not detected, but not doing so for values that were below the detection limit. Because a large part of the results compares the % detection by each method, the inconsistency in the handling of values below LOD is a concern.

RESULTS

1) Page 18
Authors should address results if the true relative risk is 1.5. Do the same results hold, or do a much greater % become unity? This has implications for the generalizability of their findings and the sensitivity of the used bag method as an exposure metric. Is the used bag a suitable surrogate for HSV3 only for studies with a true relative risk of 2.0 or greater?

- Discretionary Revisions

ABSTRACT

1) Methods, Page 3

“HSV3 samples were collected in one room.”

Authors need to identify which room the HSV3 sample was taken in order to understand the comparison to household vacuum

2) Results, Page 4

Would prefer the mean or median % agreement with the range in parentheses to assess if agreement was closer to 100% or 75%.

3) Results, Page 4

Present p-values with Spearman correlation coefficients

MANUSCRIPT

1) Background, Page 6

Reference 4 is for pesticides but sentence refers to ‘pesticides and other chemicals’. Add references for the other compounds in study.

2) Background, Page 6

“The HSV3 is designed…to achieve constant dust removal efficiency across different surfaces…”

It is unclear if the HSV3 was used for only carpet dust sampling or if it was used ‘across different surfaces.’ The interest is whether or not the household vacuum bag is related to carpet dust or room dust, in general.

3) Methods, Page 11

Were field duplicates taken with the HSV3 to compare intra-room variability? If not, the reason for not conducting a field duplicate should be stated. If duplicate samples were taken, report the comparability.

6) Methods, Page 11

Add sample storage temperature.
7) Methods, Page 12

Were field blanks used for the HSV3 or only a solvent blank? Also, change ‘a duplicate’ to ‘a lab duplicate’ as this is not a field duplicate.

RESULTS

1) Page 18

“Paired t-tests showed no significant differences in concentrations…”

Should be ‘log concentrations’

2) Page 18

For compounds with low Spearman correlations, the authors re-state that they were ‘detected infrequently’. As they were detected infrequently, and values below the LOD are given the value of ½ LOD, then this would increase the correlation coefficient as both methods would yield a higher number of perfectly correlated values. If only detected values were analyzed for Spearman correlations, then the ‘detected infrequently’ statement is less informative than a p-value.

4) Page 20

“…8 to 9 of 15 samples)…”

Unclear what is meant by ‘8 to 9’

1) Table 1

Include ‘n’ for number of samples in correlation analysis. It is unclear if all samples were included or only if detected in both HSV3 and used bag.

What next?: Accept after minor essential 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.