Reviewer's report

Title: Dental amalgam and urinary mercury concentrations: a descriptive study

Version: 2 Date: 28 October 2012

Reviewer: Lars Bjorkman

Reviewer's report:

Major Compulsory Revisions

1. Abstract: Upper percentiles (e.g. 99% and 99.9%) should be given in order to provide information about the distribution (see below).

2. Background: “…the rate of release decreasing over time…” Data from the cited in vitro study is not supported by in vivo studies.

3. Background: “Only 15.25% of the total mercury released from dental amalgam is absorbed; …” A confidence interval should be given in order to provide an estimate of the precision.

4. Methods (3rd paragraph): Describe how the number of amalgam surfaces was registered.

5. Methods (3rd paragraph): “To account for survey design effects, standard errors, coefficients of variation and 95% confidence intervals were estimated using the bootstrap technique.” Explain and give reference(s).

6. Methods: Describe methods used for analytical quality assurance and results from the quality control.

7. Results: Plots showing the cumulative frequency of mercury concentration in urine for individuals with and without amalgam should be given in addition to percentiles (e.g. the 99 percentile and the 99.9 percentile). Without information on the upper tail of the distribution it is difficult to use data from the study properly.

8. Results (2nd paragraph): Children 6-11 years of age with the largest number of amalgam surface restorations (i.e., 26-30) had a mean urinary mercury concentration of 4.77 µg Hg/g Cr. How many % in this group had values above 5 µg Hg/g Cr?

9. Discussion: A comment to reference 12 is published (Barregard L: Mercury from dental amalgam: looking beyond the average. Occup Environ Med. 2005 Jun;62(6):352-3). In this reference important issues are discussed which have to be taken into consideration and discussed in the present paper.

10. Discussion (3rd paragraph): “The estimate provided was 4.77 µg Hg/g Cr, and it should be interpreted with caution due to high sampling variability.” Give
quantitative estimates of the sampling variability and describe how the estimates were calculated.

11. Discussion (3rd paragraph): “Although the largest, this value is lower than the value below which there are no known risks to health [11].” See comments above.

12. In the Conclusions section the sentence «The results indicate that the mean urinary mercury concentrations in the general Canadian population are significantly lower than the values considered to pose any risks for health» is misleading: It is important to discuss the size of the fraction in the population with the highest exposure. Mean values are relevant when the central tendency is described, but provide no information regarding the upper (or lower) tail of the distribution. In this case the upper tail is of particular interest. Only giving mean values is misleading when the upper tail is of interest.

13. Tables: Give numbers in each category. Give values even for cells with small sample sizes.

14. The references should be updated and preferably peer reviewed references should be used.

Minor Essential Revisions

1. Methods: “The level of detection for inorganic mercury in urine was 0.10 µg Hg/L [3].” According to the reference the LOD for inorganic mercury in urine was 0.20 µg Hg/L (see errata page E-2).

**Level of interest:** An article of limited interest

**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.