Reviewer's report

Title: Childhood lead exposure in France: benefit estimation and partial cost-benefit analysis of lead hazard control

Version: 1 Date: 17 February 2011

Reviewer: David Bellinger

Reviewer's report:

I approached this review as an individual who has been involved in lead research, but not from the perspective of cost-benefit analyses. Therefore, my comments pertain largely to issues of clarity and consistency.

I consider that all of my suggestions are discretionary.

Abstract
1. “respectively” in the first sentence can be deleted.

Background
2. The sentence on lines 3-4 implies that lead exposure that could be attributed to its use as a petrol additive was organic lead, which is incorrect. Tetraethyl lead was the form added to petrol, but after combustion, it was emitted as inorganic lead from the tailpipe.

3. lines 5-6: A reference should be provided for the statement that food is “the major source” of lead exposure. The reference that is provided at the end of the sentence seems to refer to the statement that cereals and vegetables are responsible for most foodborne lead exposure. This statement that food is the major source is inconsistent with the information on the correlates of blood lead levels presented in Methods, where contaminated dust and soils are identified as being of major importance as predictors of blood lead levels greater than 100 ug/L. Perhaps the issue is that the relative importance of different sources/pathways depends on the portion of the blood lead range under consideration.

4. line 99+: I found this sentence difficult to understand, specifically the phrase, “...distribution per media for weekly lead exposure of children selected at the 75th percentile...” Perhaps it could be revised to make it clearer.

5. line 119: The double negative (“... absence of no threshold level currently established...” is a bit confusing. I would suggest simplifying this sentence, to something such as, “Given that no threshold for lead toxicity has been established...”

6. line 121: It is internally inconsistent to state that no threshold has been established and then to assume several values for the blood lead level at which IQ loss starts (15, 24, and 100 ug/L). On line 194, it is stated that a 1 point IQ loss is associated with an increase in blood lead level from 15 to 24 ug/L. If a
slope of -0.51 points per 10 ug/L is assumed, along with the absence of a threshold, a loss of approximately 0.75 point should be assumed for the range of 0-15 ug/L.

7. line 125: The assumption of a 1.9 point IQ loss at blood lead levels above 100 ug/L does not accurately reflect the findings of the Lanphear et al (2005) analysis. A loss of 1.9 points was associated with an increase from 100 to 200 ug/L, so that not all children with a blood lead level greater than 100 would be expected to incur such a loss.

8. line 168: The cost associated with a blood lead level >100 ug/L (1,819 to 4,851) is not just the cost of screening but also includes other interventions that might be undertaken.

9. line 174+: It is assumed that a child with a blood lead level >300 ug/L would undergo chelation. Most centers currently would not use chelation under such circumstances, reserving it for children with a level greater than 450 ug/L.

10. line 203+: The sentence, “For the 2008 cohort...” is not clear to me. Can it be rephrased?

11. line 217: The costs estimated for special education are based on the expenditures at two French institutions that care for children with “severe cognitive and behavioral impairment.” Are these costs reasonable to assume in this analysis insofar as the IQ losses being assumed to result from lead exposure would not be expected to result in “severe” cognitive and behavioral impairments. Can the argument supporting the use of these estimated costs be strengthened?

12. line 222: I would suggest that a paper other than Nevin (2006) be used to support any statements about blood lead levels at which increased service needs become evident. Nevin’s analyses, while provocative, provide only weak support for inferences about critical dose.

13. line 277: I would suggest that the use of “threshold values” here (and throughout the manuscript) be eliminated. As the authors note, recent risk assessments have not identified threshold values for the critical health effects of lead.

14. line 311: The units should be changed from ug/dL to ug/L.

15. line 322+: Would it be possible to place confidence intervals around the estimates of benefits and costs? While the sensitivity analyses conducted provide the reader with some sense of the precision of the estimates, providing 95% CIs would provide even more information.

16. line 401: “for the blood lead ranges of 15, 24, and 100 ug/L” should be added before “respectively” at the end of this sentence

17. line 500” “low” blood lead levels should be clarified as pertaining to levels below 100 ug/L.

18. line 504: It is not clear what is meant by, “...the now low prevalence of unacceptably high B-Pb concentrations.” My interpretation of the analyses presented is that levels less than 100 ug/L should be considered “unacceptably high” insofar as most of the social costs are attributable to children with levels in
that range.

19. Tables: It would be helpful if the authors could lead the reader through the tables, clarifying how the various calculations were carried out. This could be done in a footnote. In their present form, it is somewhat difficult to see how the numbers in the different columns were combined to produce estimates.

20. Table 4: The footnote is hard to understand (e.g., “rate max 20% applied to €13000 of classic works

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I declare that I have no competing interests.