Reviewer's report

Title: Intelligence gain and social cost savings attributable to environmental lead exposure reduction strategies since the year 2000 in Flanders, Belgium

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Reviewer: David Bellinger

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This is a generally clear and thoughtful presentation of analyses that estimate the IQ gain and cost savings associated with the decrease in the blood lead levels of Flemish adolescents over a 15 year period. The authors identify the key assumptions made and justify them. The calculations themselves are straightforward. The results are specific to the situation in Flanders, but the principles can easily be applied to other regions. The approach can be used to estimate the impacts of many other environmental policies, so the specific value of the paper is the generalizability of the methods to other issues.

Two issues that the authors mention warrant more attention. First, the assumption is made that there is no IQ loss associated with a blood lead concentration below 2 micrograms per deciliter. Although the dose-effect relationship on which the calculations are based, the pooled analyses of Lanphear et al. (2005), did not estimate IQ loss in that range, other literature supports the hypothesis that there is no safe ("threshold") blood lead concentration for adverse cognitive effects. Assuming a linear relationship between IQ loss and blood lead concentration below 2 would produce a much greater estimate of total IQ loss in the population due to the large proportion of children in the cohort studied for whom concentration fell in that range.

The second issue is that in most settings, especially higher-income countries, blood lead concentrations are considerably higher in young children than in adolescents. Therefore, calculating IQ loss based on adolescent concentrations will seriously underestimate the total health losses. The authors' contention that it is blood lead concentrations in middle childhood that are most predictive of IQ loss does not rest on very compelling evidence (even in the pooled analyses). This limitation should be given greater prominence in the Discussion.

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