Low-Level Environmental Lead Exposure in Childhood and Adult Intellectual Function: A Follow-up Study.
Mazumdar, et al.

The Boston prospective study of lead and child development has historically been one of the most influential among the several that were initiated in the late 1970s and early 1980s. Indeed, the decision by the United States Centers for Disease Control and Prevention to announce a new action level of 10 ug/dL whole blood lead in 1991 was largely based on this study’s finding of lead-associated reductions in scores on the Bayley Scales of Infant Development at two years (Bellinger et al. NEJM, 1987). The last major follow-up of this cohort occurred when subjects were approximately 10 years of age (Bellinger et al. Pediatrics, 1991).

This manuscript reports on an ambitious effort to recall this longstanding birth cohort as they reached 29 years of age. The findings of this study are consistent with other investigations that have found that early exposure to higher levels of lead is associated with long-term and apparently irreversible effects on behavioral, cognitive, and neuroradiological endpoints in adults (e.g., Yuan et al. Pediatrics, 2006; Cecil et al. PLoS Medicine, 2008; Wright et al. PLoS Medicine, 2008; Brubaker et al. Neurotoxicol, 2009; Brubaker et al. Neurotoxicol, 2010; Cecil et al. Environ Hlth Perspect, 2010). Some of the coauthors on this paper are well established pioneers in the modern era of lead neuroepidemiology.

The limitations of this study largely revolve around small sample size and it is unfortunate that more subjects could not be recalled. However, given the historical importance of this study these data are still interesting and potentially important.

Page 3, Par 1, Line 1: It is unclear to this reviewer what the authors mean when they refer to lead as a “…versatile neurotoxicant…” It is true that lead has multiple potential effects on the central nervous system partly by virtue of its ability to mimic calcium ions (e.g., see Lidsky & Schneider, Brain, 2003).

Page 5, Par 4, Line 4: To avoid confusion, please consider labeling the mean of 4 and 10 year blood lead concentration as Average Late (or later) Childhood Blood Lead.
Page 6, Par 2, Lines 6-9: Given the small sample size, would it not be more appropriate to use percent change (e.g., 10%) in the lead regression coefficient(s) rather than p-values?

Page 7, Par 2, Lines 2-4: Again, given the small sample size I think providing parameter estimates and standard errors rather than p-values would be more appropriate.

Page 7, Par 2, Line 4: Again later childhood blood lead to avoid confusion.

Page 8, Par 1, Line 3: I think you mean Table 3, not Table 2.

Page 9, Par 2, Line 2: “…related to IQ in adulthood…”

Page 9, Par 2, Line 6: “…supported the hypothesis…”

Page 9, Par 2, Line 11: “…inverse relationship to IQ in…”

References: No year of publication provided for reference #4.

Table 1: Blood lead concentrations are arithmetic means I believe – if so please indicate.

Table 2 and in general: Do the authors think it is interesting that Performance IQ seems to be more consistently and strongly associated with childhood blood lead concentrations? I don’t see any mention of this in the manuscript.

Figure 1: Are these data restricted only to those in your current analyses (N = 43)? Some of the outlying blood lead concentrations are quite high (more than 60 ug/dL) and there is no mention how this was handled in the analyses.

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

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.