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Children's blood lead and standardized test performance response as indicators of neurotoxicity in metropolitan New Orleans elementary schools

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Abstract

This study analyzes pre-Katrina variation in aggregate student performance and children's blood lead (BPb) in 117 elementary school districts in metropolitan New Orleans. Fourth grade student achievement on Louisiana Educational Assessment Program (LEAP) tests were analyzed as a function of BPb for children 1–6 years old within school districts, controlling for student–teacher ratios, percent of students eligible for a free or discounted lunch, and school racial demography. Measures of performance across subject areas (English Language Arts, Science, Mathematics, and Loading [MathJax]/jax/output/SVG/jax.js Int Test Scores (ATS) and indices of agreement and variation in student achievement. ATS are measured on a 5-point scale, corresponding to achievement categories of advanced = 5 to unsatisfactory =Â 1. Regression results show that median BPb ($\hat{1}^{1}/4g/dL$) and percent of children with BPb \hat{a} %0¥10 $\hat{1}^{1}/4g/dL$ are significantly associated with reductions in test scores across all subjects and depress variation in student performance across achievement categories. These data suggest that assisting children with improved school performance requires alleviation of pre-school Pb exposure and its associated neurotoxic damage. Cost–benefit calculations suggest that it is more cost effective to pay for onetime primary prevention instead of paying continuous expenses focused on reversing neurotoxic damage.



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Keywords

Fluoridated water; High stakes testing; Racial demography; School achievement test scores; Soil lead; Student–teacher ratio

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