Childhood blood lead levels rise and fall with exposure to airborne dust in urban areas

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(Medical Xpress)—A new nine-year study of more than 367,000 children in Detroit supports the idea that a mysterious seasonal fluctuation in blood lead levels—observed in urban areas throughout the United States and elsewhere in the northern hemisphere—results from resuspended dust contaminated with lead.

The scientists, who report in the journal Environmental Science *&Technology* (ES&T), say the results have implications for government efforts to control childhood exposure to lead, which can have serious health consequences.

Shawn P. McElmurry and colleagues point out that average blood lead levels in the U.S. and globally have declined following the elimination of lead from gasoline, paint, water pipes and solder used to seal canned goods. In addition to McElmurry, who is with Wayne State University in Detroit, the international team included Sammy Zahran of Colorado State University; Gabriel M. Filipelli of Indiana University-Purdue University, Indianapolis; and Mark Laidlaw and Mark P. Taylor of Macquarie University in Sydney, Australia.

Much of the current lead in major urban areas is from those "legacy" contaminants. Modern human exposure takes the form of fine particles, deposited in the soil years ago, that are swept up into the air. Past research identified a seasonal trend in blood lead levels in children in multiple North American cities, including Washington, D.C., New York, Chicago and Milwaukee. Those levels increase, often by more than 10

percent, in July, August and September. Blood lead levels then decrease during winter and spring.

The scientists set out to test a hypothesis implicating contact with lead-contaminated dust while children are outdoors and engaged in warm-weather activities—at a time when wind, humidity and other meteorological factors increase the amounts of dust in the air. Their ES&T report describes research that strongly implicates airborne dust as the reason for the seasonal trends in blood lead levels. It shows a correlation between atmospheric soil levels in Detroit and blood lead levels in children.

"Our findings suggest that the federal government's continued emphasis on lead-based paint may be out-of-step (logically) with the evidence presented and an improvement in child health is likely achievable by focusing on the resuspension of soil lead as a source of exposure," the report states. "Given that current education has been found to be ineffective in reducing children's exposure to Pb, we recommend that attention be focused on primary prevention of lead-contaminated soils."

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More information: The full text of the study is available at pubs.acs.org/stoken/presspac/p … bs/10.1021/es303854c.

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