Positive outcomes from U.S. lead regulations, continued challenges, and lessons learned for regulating emerging contaminants

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Abstract

Albeit slow and not without its challenges, lead (Pb) emissions and sources in the United States (U.S.) have decreased immensely over the past several decades. Despite the prevalence of childhood Pb poisoning throughout the 20th century, most U.S. children born in the last two decades are significantly better off than their predecessors in regards to Pb exposure. However, this is not equal across demographic groups and challenges remain. Modern atmospheric emissions of Pb in the U.S. are nearly negligible since the banning of leaded gasoline in vehicles and regulatory controls on Pb smelting plants and refineries. This is evident in the rapid decrease of atmospheric Pb concentrations across the U.S over the last four decades. One of the most significant remaining contributors to air Pb is aviation gasoline (avgas), which is minor compared to former Pb emissions. However, continual exposure risks to Pb exist in older homes and urban centers, where leaded paint and/or historically contaminated soils+dusts can still harm children. Thus, while effective in eliminating nearly all primary sources of Pb in the environment, the slow rate of U.S. Pb regulation has led to legacy, secondary sources of Pb in the environment. More proactive planning, communication, and research of commonly used emerging contaminants of concern that can persist in the environment long after their initial use (i.e., PFAS) should be prioritized so that the same mistakes are not made again.

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