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The Long Legacy of Lead

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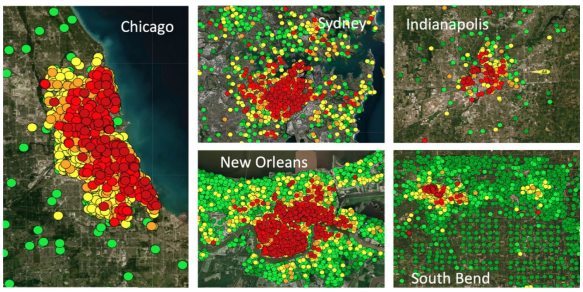
Unsafe levels of lead exposure have occurred in many communities across the World, with much of the burden resting on lower income communities, and communities of color. Lead exposure is prevalent due to past lead emissions and the substantial legacy lead loads that remain in soils and structures within communities The reason behind the disproportionate exposure are myriad, including environmental racism and other societal shifts during the twentieth century, but the results are manifest in lower educational outcomes and lower economic potential for exposed communities. Despite immense current federal efforts to “get the lead out,” our global lead problem is nowhere near over (Figure 1). In mining communities around the world, the problem can be especially severe as the legacy of post-Colonial abandonment has left communities like Kabwe, Zambia absolutely devasted with soil lead pollution.

In the USA, with the Clean Air and Clean Water Acts, US policy began severely limiting the production and use of lead in infrastructure and consumer products, including water pipes, paint, and gasoline that have been historical sources of lead entry into the environment. The results have been stunningly successful and positive overall—with a decline in the percentage of children affected by lead (by modern standards) from nearly 100% of the population in the 1970s to about 1% today. However, these improvements in health outcomes are not shared equally, and many urban children are still exposed to lead at unsafe levels. Degradation of aging lead−based paint on pre−1980s housing, and past deposition from leaded gasoline and industrial emissions, means that urban lead is now in the soils and dust upon which neighborhoods are built, children play, and food is grown. In other words, our modern lead problem is a legacy of historical contamination: the lead is still largely present the environment and posing continued risks to communities, with one in four USA households exhibiting soil lead values above the safety recommendations [1].

[1] Filippelli, G.M., Dietrich, M., Shukle, J., Wood, L., Margenot, A., Egendorf, S.P., and Mielke, H.W., 2024. One in four US households likely exceed new soil lead guidance levels. *GeoHealth*, 8, e2024GH001045. https://doi.org/10.1029/2024GH001045



ig. 8 Soil lead values from the community science program Map My Environment (www.MapMyEnvironment.com) showing elevated soil lead (in reds and ranges) in the urban cores of large cities (i.e., Chicago and Sydney), medium cities (i.e., Indianapolis and New York) and a small city (South Bend, Indiana).