

## **Self-Regulation in the Age of Urban Revitalization: Evaluating Lead Dust Fallout From Residential Demolitions in Detroit, MI**

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UMMS Capstone for Impact

Branch: Systems Based, Hospital Based

### **Project Summary**

The introduction and enforcement of comprehensive dust control measures in the City of Detroit Demolition Specification has made Detroit a national leader in responsible demolition practices. In partnership with the City of Detroit Health Department, the National Institutes of Health Environmental Health Sciences Core (EHSC) at the University of Michigan School of Public Health has provided funding for a pilot study of dust fall near residential demolitions in Detroit. As demolition continues at a high volume, this study is an opportunity to validate this important effort to protect public health, and substantiate additional costs and oversight required for responsible demolition.

The demolition of vacant homes can spread dust to nearby surfaces such as sidewalks, lawns, streets, or exterior surfaces of homes. When lead dust is deposited onto publically accessible areas, it can be unknowingly tracked into homes where it has greater opportunity to be ingested or inhaled by children.

To validate the effectiveness of dust suppression techniques in the Detroit Protocol, we compared dust fall from demolitions in Detroit with measurements from a Chicago study of single-family housing demolition, as well as other investigations of multi-family housing demolition conducted in Baltimore, MD. , Our study measures dust fall using similar EPA and APHA-recognized methods, which allow dust to settle in plastic containers of deionized water for a measured time period as demolition activities occur. From these samples, extensive laboratory procedures are used to precisely measure the rate of dust fall per hour for a given area, and the concentration of lead contained in that dust.

Principal investigators of this study include Regina Royan (UM Medical School; Detroit Health Department), Dr. Stuart Batterman (UM Professor of Engineering, Industrial Hygiene and Environmental Health Sciences) and Dr. Eden Wells (UM Clinical Associate Professor of Epidemiology and Preventative Medicine). Data collection and laboratory analysis are performed by University of Michigan medical students and graduate students. In addition, young adults from Detroit's Green Door Initiative job-training program assist with the project in the field and have the

opportunity to receive laboratory training in Ann Arbor. Qualitative feedback on demolitions and study updates were provided to the Detroit Building Authority Demolition Best Practices Workgroup on a monthly basis."

### **Action Items/Outcome**

Results support our hypothesis that the Detroit Protocol results in lower geometric mean levels of lead dust than the wet-wet methods recently used in Chicago. An important strength of this work is the access that researchers are given to demolition sites, allowing us to capture the whole demolition event and also collect samples close to the work area. With a more robust sample size, this will allow us to better understand the distance that dust may travel. Previous studies report their estimates may be conservative, as sampling may have started once the demolition was already underway.

Currently, there are no health-based regulations for exterior settled dust that may result from demolition. To provide real-world context for the quantity of lead dust resulting from demolition activities, the number of days of additional background-level lead exposure a resident might experience due to nearby demolitions was estimated. Since much of the seasonal variation in children's blood lead levels can be explained by resuspended lead from the soil, these results highlight the significant value of the rigorous testing of backfill soils and site finishing requirements (including top soil and seed) which are included in the Detroit Protocol.

### **Conclusion/Reflection**

Results suggest that demolitions following the Detroit Protocol have lower total lead deposition rates than other wet-wet demolition methods of similar housing stock in Chicago. Ongoing observation and analysis of demolition activities will continue to be shared with the Detroit Building Authority in order to safely and efficiently remove hazardous vacant properties from Detroit's neighborhoods.