

Living Lead Safe: Helping Pregnant Moms Bring Baby Home to a Lead Safe Environment



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Abstract

South Bend, the 4th largest city in Indiana, is facing a significant lead exposure crisis, primarily due to its aging housing stock—80% of homes in South Bend (1) and 66% across the county were built before 1980, many of which still contain lead-based paint. Lead exposure poses serious and irreversible health risks to young children, yet much of the current response relies on traditional inspections that, while important, are limited in speed, cost-efficiency, and reach. As an innovative alternative, the Notre Dame Lead Innovation Team (ND-LIT) has developed a low-cost, high-accuracy lead screening kit that tests for lead in paint, dust, soil, and water—allowing risks to be identified and addressed before exposure occurs. The kit is 96% accurate and is designed to be accessible and scalable. ND-LIT's approach is grounded in community partnerships and equity, working alongside local organizations to ensure that vulnerable households receive timely support. Together, these efforts offer a proactive and sustainable path towards reducing lead exposure and building safer, healthier homes throughout South Bend and St. Joseph County.

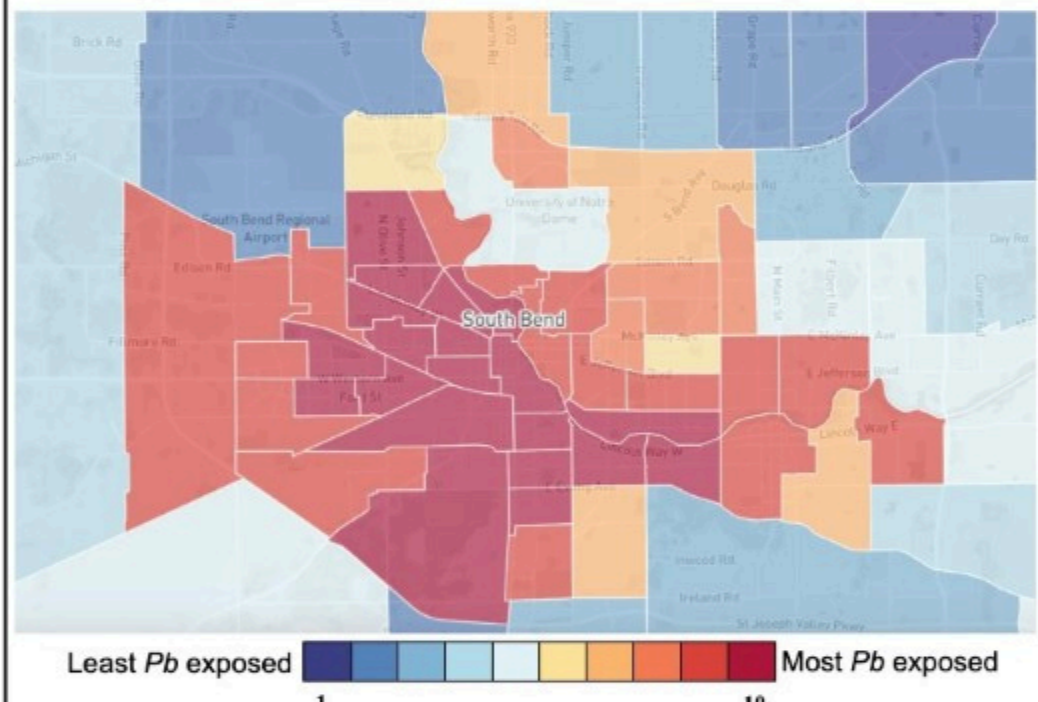
The "Problem"

Lead exposure is a global, invisible crisis with lifelong impacts, especially on children.



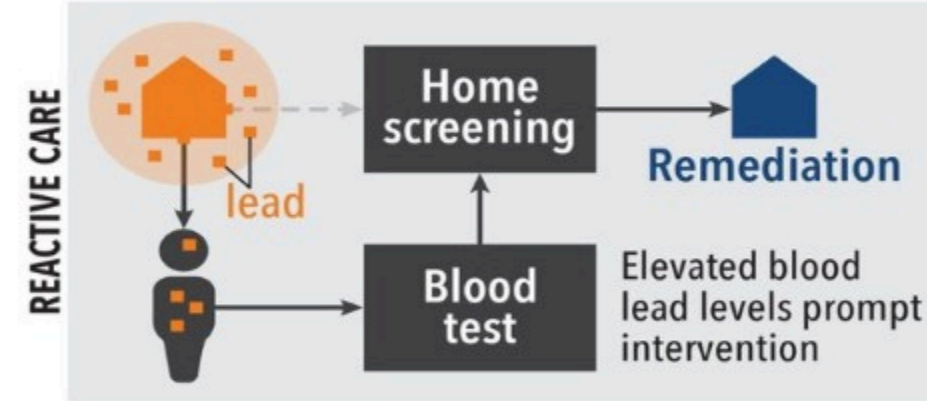
Figure 1 Comprehensive statistics on global blood lead levels in children. Source: Pure Earth. Global Lead Pollution Map; <https://leadpollution.org/>

From worldwide to the U.S., in cities like South Bend, aging homes reveal how this global threat hits hardest in our own backyards.



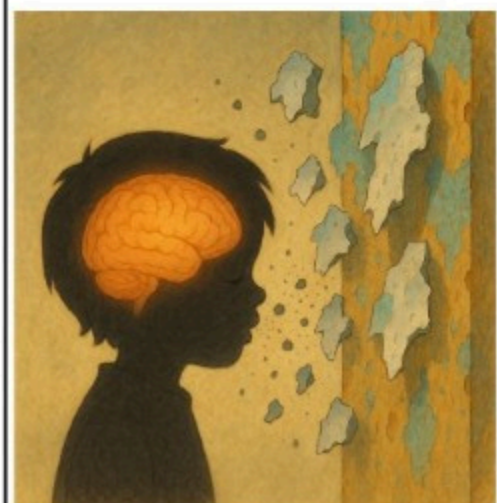
Source: Vox. This City's Lead Poisoning Crisis Should Be a National Scandal; <https://www.vox.com/public-health/413352/donald-trump-rfk-milwaukee-schools-lead-poisoning>

South Bend's lead poisoning crisis is driven by its aging housing stock, with 80% of homes built before 1980. In St. Joseph County, 66% of homes were built before 1980 and 28% were built before 1950.



Testing & Exposure Stats

- Fewer than 10% of children under age 7 were tested for lead between 2005 and 2015.
- Among those tested, nearly 1 in 10 had elevated blood lead levels (EBLLs).
- In South Bend's Near North Neighborhood, 36.4% of children had EBLLs—the highest rate in Indiana.



"It makes you feel helpless — knowing your child was exposed before you even had a chance to protect them."— Single mom, renter in St. Joseph County

Health Department Capacity & Cost

- Local Health Department (LHD) conducts about 100 home assessments per year.
- Cost of each Lead Inspection and Risk Assessment (LIRA): \$400–\$600.
- At this rate, it would take 500 years and \$45 million to assess every home built before 1980 in the county.

The "Innovation"

Don't wait for harm to happen — detect lead hazards early, easily, and affordably.

Notre Dame's Lead Screening Kit

- Cost of manufacturing \$12, and cost of analysis \$8.
- 96% accurate.
- Tests lead in paint, dust, soil, and water.

Collect Samples from Your Home
 Paint chips, soil, dust wipes, and tap water — simple to do yourself.

Send Samples to Our Lab
 Analyzed with state-of-the-art X-Ray Fluorescence (XRF) technology.

Get Your Results
 Delivered securely and clearly through REDCap — fast and easy to understand

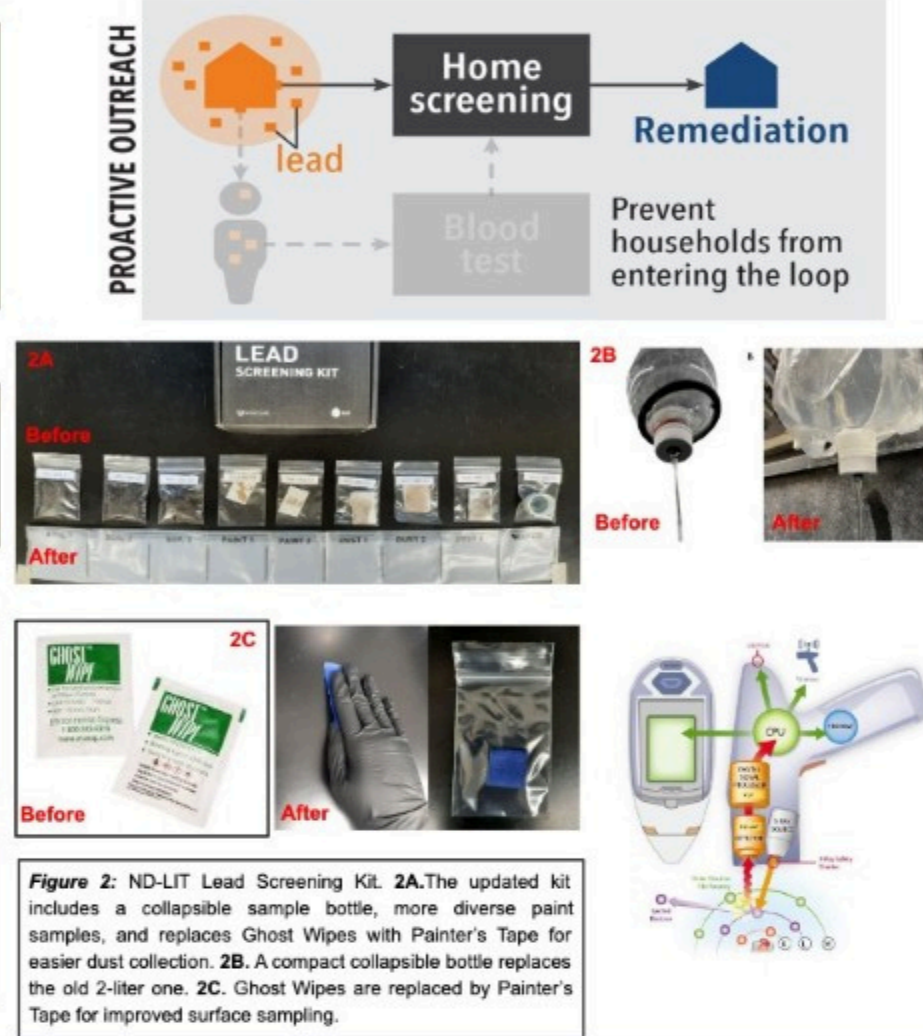


Figure 2: ND-LIT Lead Screening Kit. 2A. The updated kit includes a collapsible sample bottle, more diverse paint samples, and replaces Ghost Wipes with Painter's Tape for easier dust collection. 2B. A compact collapsible bottle replaces the old 2-liter one. 2C. Ghost Wipes are replaced by Painter's Tape for improved surface sampling.

The "Impact"

Lead Screening 2019-2025

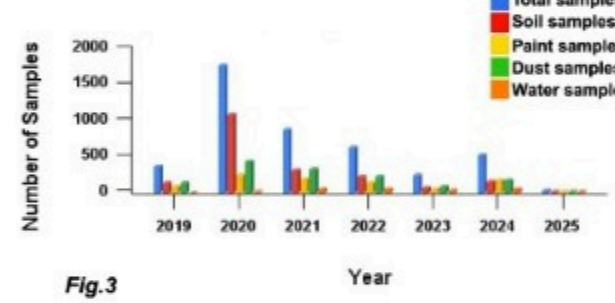


Fig. 3

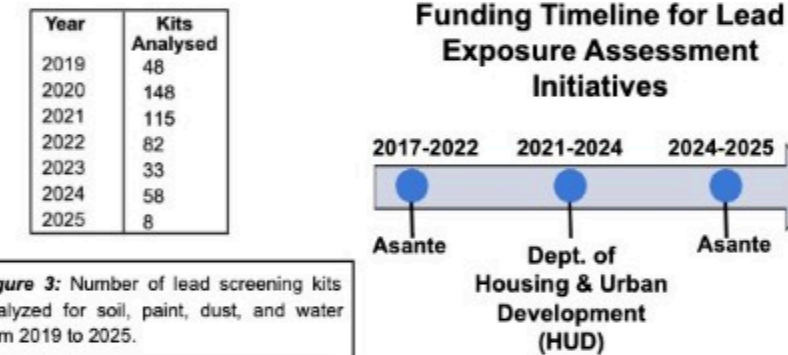


Figure 3: Number of lead screening kits analyzed for soil, paint, dust, and water from 2019 to 2025.

Lead Detection in Soil 2019-2025

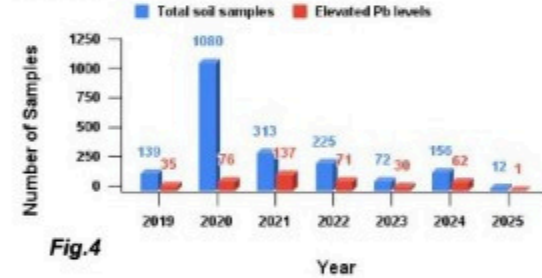


Fig. 4

Lead Detection in Paint 2019-2025

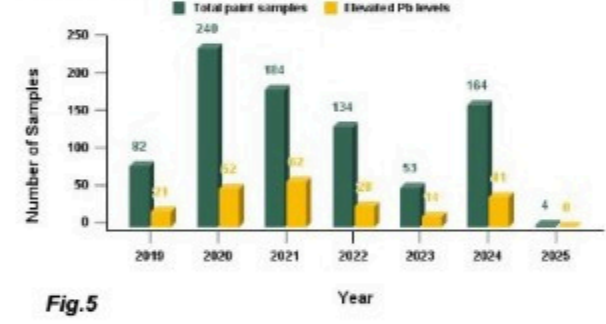


Fig. 5

Lead Detection in Dust 2019-2025

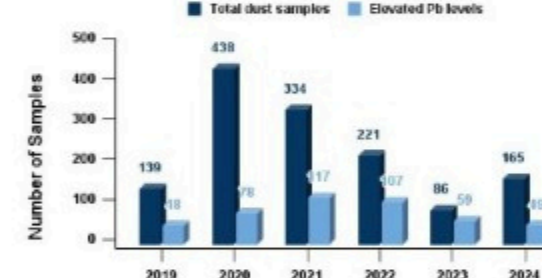


Fig. 6

Lead Detection in Water 2019-2025

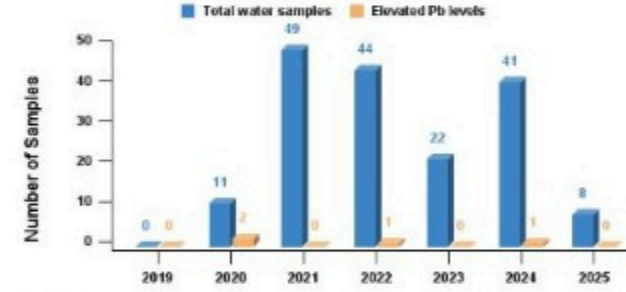


Fig. 7

Figures 4–7: Annual Distribution of Total and Elevated Lead Samples (2019–2025) These figures illustrate yearly counts of collected and lead-positive samples across four environmental matrices: Figure 4, displays soil data, Figure 5, pertains to residential paint, Figure 6, presents household dust, and Figure 7, covers water samples. For each, samples exceeding established lead risk thresholds are delineated to emphasize trends in lead contamination relative to overall surveillance efforts over the study period.

Collaborating with Beacon and WIC to Support Pregnant Women with Lead Safety Education and Prevention

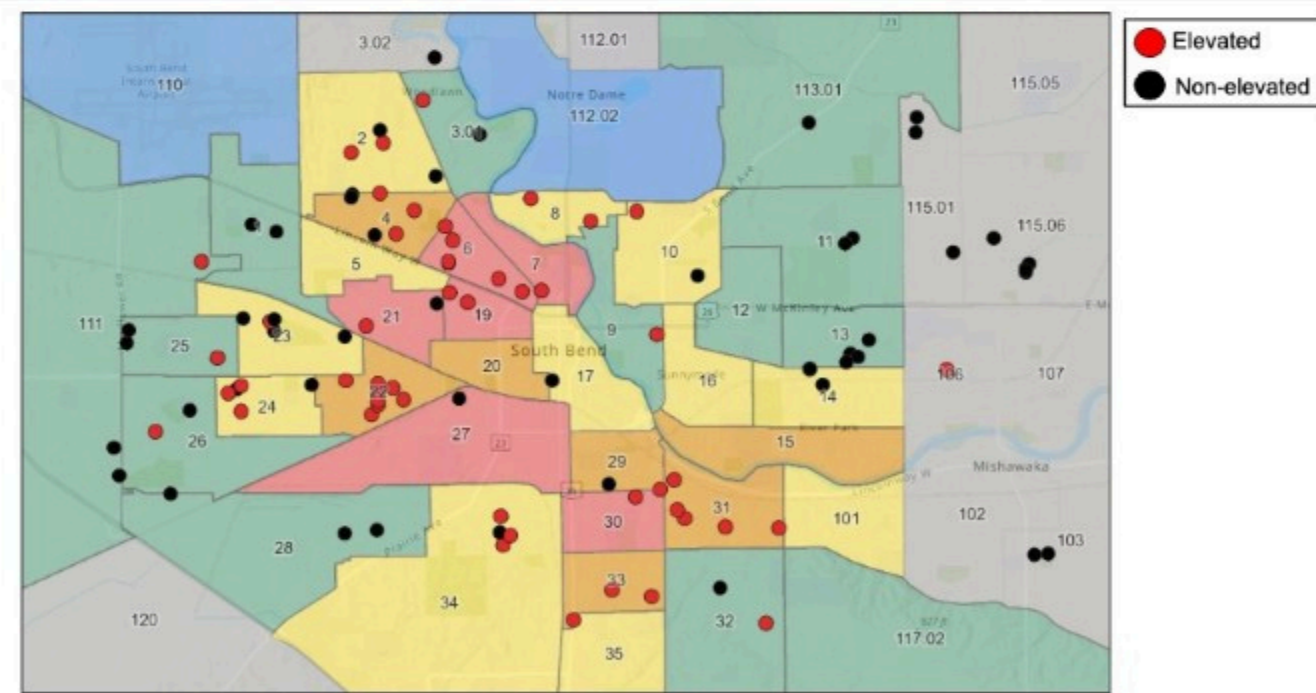


Figure 8: Heat Map of Lead Levels in St. Joseph County. Map shows lead exposure risk based on 2021 blood lead data in children under 7 and Beacon screening kits. Red = very high, orange = high, yellow = medium, green = low, blue = very low, gray = no data.

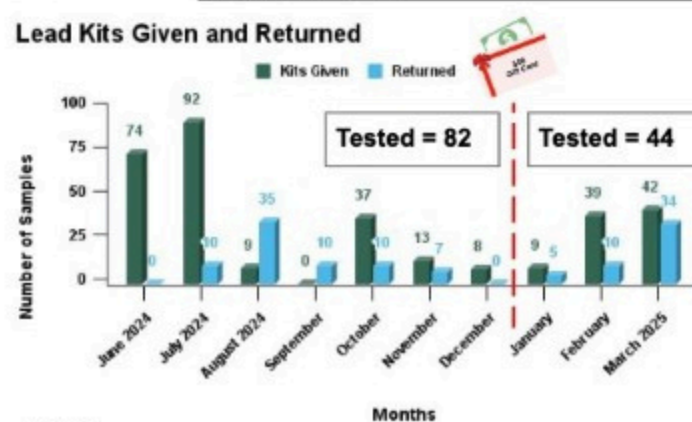


Fig. 9

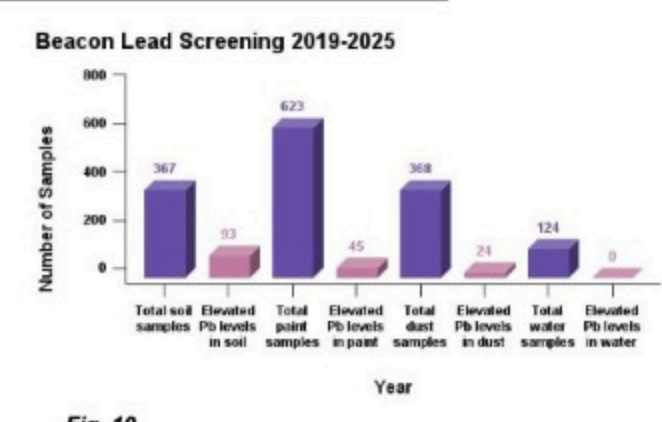


Fig. 10

Figure 9: Kits given vs. returned (June 2024–March 2025), showing a sharp rise in returns after a \$50 incentive was introduced in February 2025.

Figure 10: Beacon screening results show elevated lead levels in soil, paint, and dust, based on 1,482 samples from 125 kits.

Conclusion

- Proactive, low-cost lead screening identifies early exposure, preventing harm to children.
- Community partnerships and student involvement build trust, improve access, and strengthen university-community collaboration.
- Data-driven risk mapping and personalized reports enable targeted interventions and empower families with actionable information.
- The project informs policy and offers a scalable, replicable model for advancing environmental justice in South Bend and beyond.



Together, we can prevent lead exposure!

Future Directions

- Expand partnerships and offer lead screening at trusted hubs like Robinson Center, Women's Care Center, and E. Blair Warner School to boost access, trust, and service integration.
- Ensure regular screenings with follow-up support, including home assessments, tailored plans, referrals, and resource kits (e.g., cleaning supplies).
- Educate families with easy-to-understand materials and workshops on lead-safe habits like hygiene, safe renovations, and spotting exposure risks.
- Strengthen local capacity by training community health workers and educators to identify and address lead risks effectively.
- Promote student-driven, mentored research and community engagement to strengthen university-community partnerships and cultivate the next generation of public health leaders.
- Create policy briefs and toolkits to help agencies scale a low-cost, proactive lead screening model for underserved communities.

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