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The newsletter of The LEAD (Lead Education and Abatement Design) Group Inc.
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Global Lead News

This May 2026 issue of *LEAD Action News vol 23 no 4* has just three articles (aside from our usual please enter Volcano Art Prize and its free to subscribe to LEAD Action News articles), each of which was written with the assistance of Claude AI. Please send Letters to the Editor to help us know whether you feel, like we do, that AI, especially Claude AI is going to be a valuable asset in future publications of The LEAD Group and even future entire newsletters.

The LEAD Group Inc is honored to be an Ally of the Global Alliance to Eliminate Lead in Paint (GAELP), and most of the news articles Claude has summarised are from this United Nations and World Health Organisation alliance, from the links in their April 2026 newsletter.

Reminder: your entries in to the 15th Volcano Art Prize (VAP) are also great for you, your business and the planet! The VAP 2026 entry deadline is Mon 27th July 2026 and many past and current year entries into VAP from 2012 to 2026 are published in this issue to inspire you!

2026 Volcano Art Prize Entry
Artist: Phoenix Jewson, Age 6, School in Australia. Title: Phoenix's hand painted toucan. Lead-Safety Message: "When a toucan ingests lead shot, the acidic environment of their gizzard (ventriculus) turns the metal soluble. This highly toxic heavy metal is then absorbed rapidly into the bloodstream, where it damages the central nervous system, gastrointestinal tract, and red blood cells." Description of Work: Non-lead paint on paper. Lead-Safety Message from Google AI Assistant.

https://volcanoartprize.com/portfolio-item/phoenixs-hand-painted-toucan [LID 29435]

Contents

Enter Volcano Art Prize 2026 by 27th July 2026!

To be in the running for this **annual lead-awareness-raising global art/photo/film competition open to all ages**, just go through your smart phone photos/videos and pick a landscape-orientation one, create a short Title and Lead-Safety Message and enter as many times as you like, at https://volcanoartprize.com/submitentry/ by midnight at the end of the day, your timezone, on Monday 27th July 2026.

Once the entry deadline has passed, the Volcano Art Prize (VAP) 2026 Judge will choose the First Prize winner of $400 and 30 prize winners of a mug from Pictureproducts and you can help pick the 2026 People's Choice prizewinner. Just go to https://volcanoartprize.com/peoples-choice/ and following pages, to vote (by giving a ThumbsUp) for all the VAP 2026 entries you like, so that The LEAD Group can count up the Likes to see who wins the People's Choice Cash Prize of $200.

Volcano Art Prize

Proudly sponsored by: Pictureproducts Since 1977

It's easy to create a VAP entry!!

See Join us on our Global Lead Awareness - a reel about how easy it is to make a Volcano Art Prize entry!

Be part of a global lead-awareness raising community of photographers, artists and caring individuals!

Enter artworks, photos and short videos in Volcano Art Prize (VAP). This annual art competition has both cash/sponsors' prizes and certificates for children and encourages everyone to increase their lead knowledge by creating their Lead-Safety Message.

Images of people, old paint, pets, backyard chickens/vegetables, lead products/mining/smelting/recycling, solutions - lead-detox foods/activities/supplements, lead testing kits, etc and fun or serious videos all help The LEAD Group charity to spread the word about lead-safety around the world via social media, www.lead.org.au and www.leadsafeworld.com

Each entrant can enter multiple times.

Just go thru the camera roll on your phone or look around for inspiration and submit your own and your children's entries at www.volcanoartprize.com/submitentry by the 4th Monday in July each year. That means Monday 27th July 2026 – so you have **less than two months left to enter!!**

Only adults in OECD countries pay the AU$10 entry fee. All kids and everyone else enter for free!

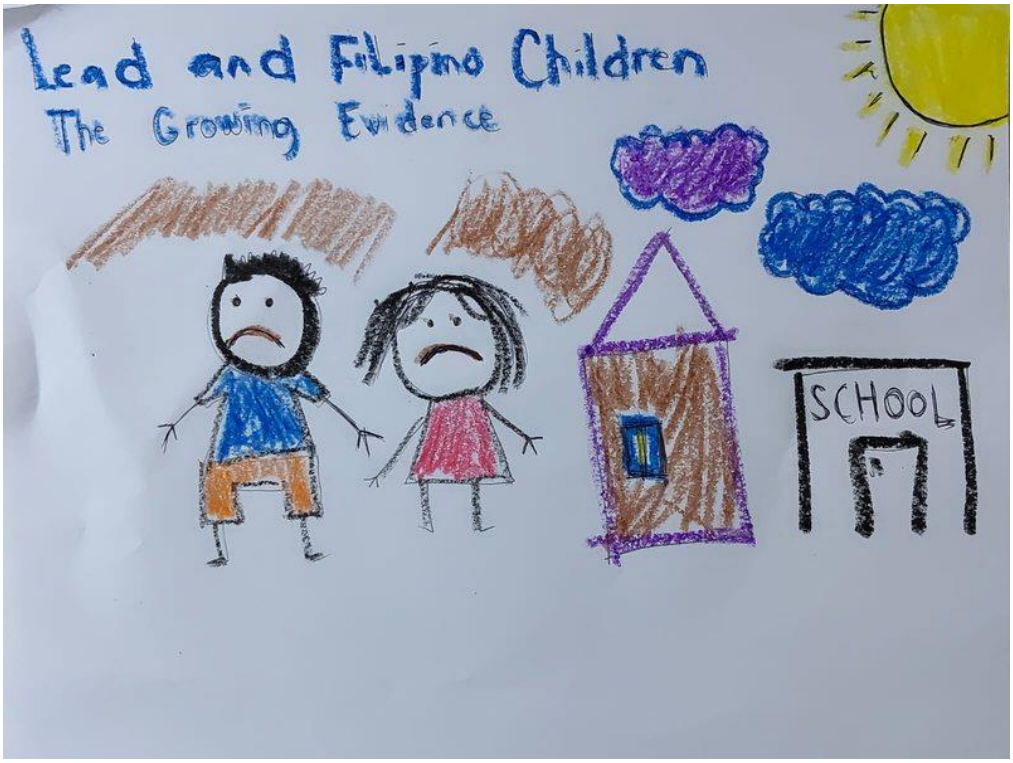
Lead and Filipino Children The Growing Evidence

Part 2 of a two-part series on lead contamination in the Philippines

By Ian Smith BSc BEng MBA, LEAD Group Systems Analyst, using Claude AI (Opus 4.6, 1M context), on research by Philippines-based LEAD Group Executive Assistants Paul Jacobe and Marie Jean Villarosa, edited by Elizabeth O'Brien BSc GradDipHealthEd, Lead Scientist, The LEAD Group Inc. Illustrated by Filipino preschool and schoolchildren's entries in to The LEAD Group's Volcano Art Prize 2026.

Abstract

In Part 1 of this series, we mapped the pathways of lead exposure that reach Filipinos, through water, soil, dust, consumer products, and the food chain. In this second instalment, we examine what that exposure means for the people it reaches, particularly children. Drawing on blood lead studies, health research, and the emerging science linking climate change to lead exposure, this article presents the human cost of the contamination documented in Part 1. It concludes with the growing advocacy movement in the Philippines, from children demanding lead-free schools to cities pioneering protective policies, and the case for sustained action.



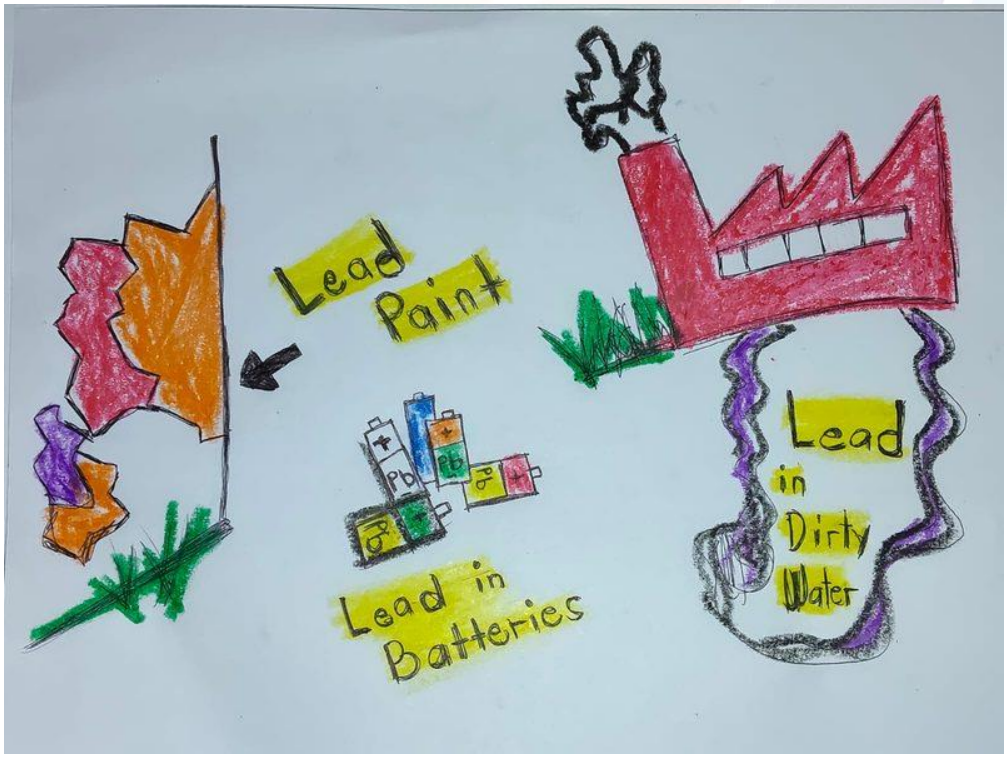
2026 Volcano Art Prize (VAP) Entry
Artist: Khai, Age 8, School in the Philippines
Title: Lead and Filipino Children
Lead-Safety Message: Me and my brother want to know the importance of the growing evidence about how toxic lead is and how to prevent lead poisoning and become lead safe.
Description of Work: Coloured pencil on pen drawing.

https://volcanoartprize.com/portfolio-item/lead-and-filipino-children/ [LID 29413]

Introduction: No Safe Level

The World Health Organization is unequivocal: there is no safe level of lead in blood (WHO 2019).

Even at concentrations too low to produce visible symptoms, lead affects the development of a child's brain and nervous system. The damage is irreversible. It accumulates silently over time, and by the point symptoms become apparent, abdominal pain, fatigue, developmental delay, significant harm has already been done.



2026 Volcano Art Prize (VAP) Entry

Artist: Paula Jacobe, Age: 11, School in the Philippines

Title: No Safe Level
Lead-Safety Message: There's no safe level of lead in the body except zero so adults need to protect us kids from lead in paint, lead acid battery recycling emissions and lead-contaminated water. Prevention starts with awareness.

Description of Work: Coloured pencil drawing.

https://volcanoartprize.com/portfolio-item/no-safe-level/
[LID 29412]

Children are disproportionately vulnerable. Infants and young children absorb four to five times more lead than adults from any given exposure (WHO 2019). They breathe, drink, and eat more per unit of body weight. They crawl on floors, play in soil, and put their hands in their mouths. Their brains are under rapid development, especially in the first 1,000 days of life, making neurological damage more likely and more lasting (ARNEC and Vital Strategies 2025). Malnourished children are at even greater risk, as calcium and iron deficiency increases lead absorption (ARNEC and Vital Strategies 2025).

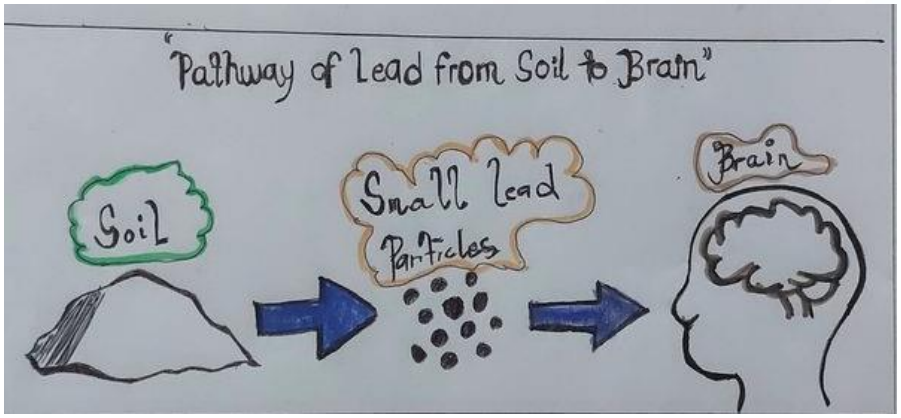
2026 Volcano Art Prize (VAP) Entry

Artist: Hailey, Age 6, School in the Philippines
Title: A Sunflower
Lead-Safety Message: A Sunflower reminds me of clearer Air but the seeds also store lead that the roots have absorbed from lead-contaminated Soil.
Description of Work: Colouring pencils on paper.
https://volcanoartprize.com/portfolio-item/a-sunflower/
[LID 29419]

In Part 1, we documented the pathways of lead exposure in the Philippines. In this article, we follow the lead into the bodies of Filipino children, and into the communities fighting back.

The Health Evidence: What Filipino Studies Reveal

The Philippines has only recently begun to systematically monitor lead levels in its children, but the studies that do exist tell a consistent and concerning story.



2026 Volcano Art Prize (VAP) Entry

Artist: Mark Antonio, Age 12, School in the Philippines
Title: Filipino Lead Studies
Lead-Safety Message: Tiny lead particles in dust and soil are inhaled and ingested then absorbed and affect brain development of children.
Description of Work: Pen and coloured pencil drawing on paper. https://volcanoartprize.com/portfolio-item/filipino-lead-studies/ [LID 29416]

In Caloocan City, part of Metro Manila, Villaluz-Martinez et al. (2012) measured blood lead levels in 86 children aged three to six. No child exceeded the then-current Centers for Disease Control and Prevention (CDC) reference value of 10 µg/dL. However, 51 per cent, 44 of 86 children, had levels exceeding 5 µg/dL, the threshold now recognised by the CDC as indicating environmental lead exposure requiring intervention. More than half of these young children were carrying a measurable lead burden, in a single neighbourhood of a single city. The study identified risk factors including lower parental educational attainment and lack of physician follow-up, suggesting that the most vulnerable families face the highest exposure.

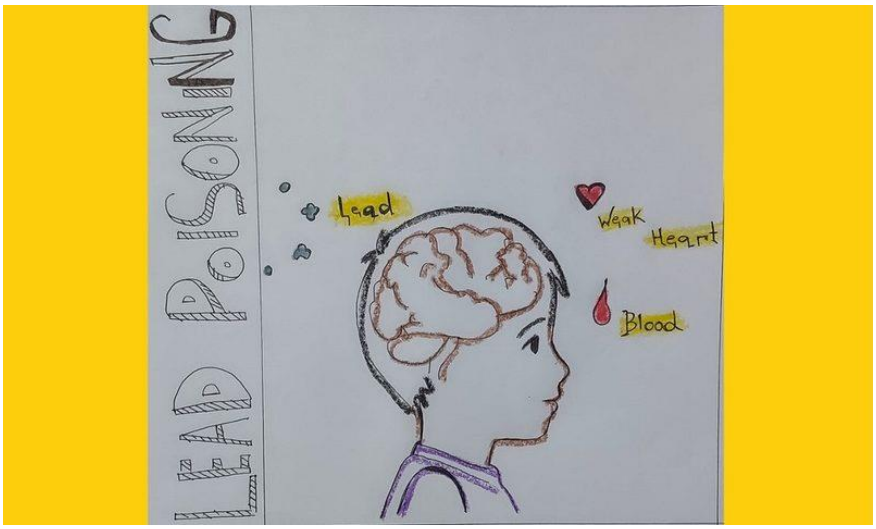
In Bulacan province, Ostrea et al. (2015) took the investigation further. Studying 150 children aged six to seven, they tested hair and deciduous teeth for lead, biomarkers that reflect longer-term exposure than blood tests. The results were striking: 91.3 per cent of children's hair samples tested positive for lead, with a median concentration of 8.9 µg/g. Nearly half of deciduous tooth samples were also positive. As documented in Part 1, the researchers traced the exposure to flood-deposited soils from the polluted river system, establishing a direct link between environmental contamination and children's body burden.

These Philippine findings sit within a global picture that is staggering in scale. The UNICEF and Pure Earth report estimated that one in three children worldwide, approximately 800 million, have blood lead levels at or above 5 µg/dL (Rees et al. 2020). A 2023 World Bank study calculated that children under five have collectively lost 765 million IQ points due to lead exposure, at an estimated cost of US$1.4 trillion in future earnings, with 95 per cent of the loss occurring in low- and middle-income countries (ARNEC and Vital Strategies 2025).

In the Philippines, doctors have publicly raised the alarm. Reports in the Philippine media have highlighted growing concern among paediatricians about rising lead exposure and its consequences for cognitive development, with physicians calling for routine screening and greater public awareness (Inquirer 2013).

How Lead Harms: The Mechanisms of Damage

Understanding why lead is so damaging requires a brief look at what it does inside the body. Moses and Ehireme (2025), in a comprehensive review of lead toxicity in animals, with direct relevance to human physiology, describe the primary mechanism as oxidative stress. Lead generates reactive oxygen species that overwhelm the body's antioxidant defences, damaging cells across multiple organ systems.



2026 Volcano Art Prize (VAP) Entry Artist: Paula Jacobe, Age: 11, School in the Philippines
Title: How Lead Harms
Lead-Safety Message: Lead replaces Iron in the blood causing anemia, reduces IQ making it harder to learn, and increases the risk of early death from stroke and heart attack. Protect Their Future: Keep Kids Safe from Lead Poisoning.
Description of Work: Pen and colouring pencils on paper.

https://volcanoartprize.com/portfolio-item/how-lead-harms/
[LID 29411]

Lead crosses the blood-brain barrier. In the developing brain, this is catastrophic. It disrupts neurotransmitter function, interferes with synaptic connections, and damages the myelin sheath that insulates nerve fibres. The result is a constellation of effects: reduced IQ, shortened attention spans, learning difficulties, behavioural problems including hyperactivity and aggression, and impaired speech and motor development (ARNEC and Vital Strategies 2025). When looking at the learning gap between what children in upper-income and lower-income countries achieve academically, research estimates that 20 per cent of the gap can be attributed to lead exposure (ARNEC and Vital Strategies 2025).

Beyond the brain, lead affects the kidneys, the cardiovascular system, the reproductive system, and the blood itself. It inhibits haemoglobin synthesis, contributing to anaemia. In animals, blood lead levels above 10 µg/dL produce clinical toxicity, with signs appearing within 24 to 48 hours of acute exposure in cattle (Moses and Ehireme 2025). Lead accumulates in bone, where it mimics calcium and can be stored for decades. During pregnancy, when the body mobilises calcium stores for the growing foetus, stored lead is released back into the bloodstream, exposing both mother and unborn child. Lead passes through the placenta and has been linked to miscarriage, premature birth, low birth

weight, and developmental abnormalities (ARNEC and Vital Strategies 2025).

2026 Volcano Art Prize (VAP) Entry

Artist: Alexa, Age 4, Pre-School in the Philippines
Title: My Happy Family
Lead-Safety Message: My family fights for lead-safety in the Philippines.
Description of Work: Crayon drawing on paper.
https://volcanoartprize.com/portfolio-item/my-happy-family/ [LID 29418]

The half-life of lead in blood is approximately 35 days, but in bone it ranges from 20 to 30 years (Moses and Ehireme 2025). This means that a child exposed today carries the consequences for a lifetime. Lead poisoning is not an acute illness that resolves; it is a permanent alteration of developmental potential.

The Climate Multiplier

As if the existing pathways of exposure were not concerning enough, climate change is amplifying lead exposure through several mechanisms.

2026 Volcano Art Prize (VAP) Entry

Artist: Liam Paune, Age 12, School in the Philippines
Title: The Climate Multiplier
Lead-Safety Message: Extreme Weather, Extreme Risks. They all make lead poisoning more likely and worse for the individual. Ask your government to act now for a safer tomorrow.
Description of Work: Crayons on paper.
https://volcanoartprize.com/portfolio-item/the-climate-multiplier/ [LID 29413]

First, rising temperatures increase the mobilisation of lead-containing dust inside homes and schools. Studies have found that children's blood lead levels peak during warmer months, likely due to increased dust exposure combined with higher metabolic rates and more time spent outdoors in contaminated environments (ARNEC and Vital Strategies 2025). In a tropical country like the Philippines, where temperatures are rising and extreme heat events are becoming more frequent, this represents a growing and year-round risk.

Second, extreme weather events, particularly flooding, spread lead contamination across communities. Ostrea et al. (2015) demonstrated this mechanism directly in Bulacan: when rivers overflow, they deposit lead-laden sediment across residential areas, creating new pathways of exposure where none existed before. As climate change intensifies the frequency and severity of flooding across the Philippine archipelago, this mechanism of contamination dispersal will worsen.

Third, the global response to climate change is itself increasing demand for lead. Lead-acid batteries remain the dominant energy storage technology for vehicles and increasingly for solar and wind energy systems. Between 2000 and 2018, the number of vehicles in low- and middle-income countries more than tripled (ARNEC and Vital Strategies 2025). As these economies electrify and adopt renewable energy, the demand for batteries, and the informal, unregulated recycling operations that process spent ones, will continue to grow. Approximately 85 per cent of global lead production goes into batteries, and an estimated half of used lead-acid battery recycling occurs in the informal sector, particularly in Africa and South Asia (Lead Elimination n.d.).

Action and Advocacy: The Philippine Response

Against this backdrop of contamination, health impacts, and climate amplification, a growing movement of Filipino advocates, researchers, and communities is demanding change.

2026 Volcano Art Prize (VAP) Entry

Artist: Clyde Evans, Age 13, School in the Philippines
Title: Philippines Lead Action
Lead-Safety Message: Take action, choose safety, advocate for health. Together, let's eliminate lead hazards from our daily lives.
Description of Work: Pencil, pen and colouring pencils on paper.
https://volcanoartprize.com/portfolio-item/philippines-lead-action/ [LID 29415]

The EcoWaste Coalition has emerged as a formidable watchdog. Their October 2025 testing of imported spray paints, which revealed products with lead levels up to 1,200 times the legal limit for new residential paint sold, many falsely labelled as lead-free, was timed to coincide with International Lead Poisoning Prevention Week, maximising public attention (EcoWaste Coalition 2025). The organisation's persistent testing and public disclosure work puts pressure on regulators and importers alike, demonstrating that civil society can fill enforcement gaps that government agencies have yet to close.

Filipino children themselves are raising their voices. In November 2024, children called publicly for lead-free schools, drawing attention to the contaminated environments documented by researchers like Ona (2010), whose study found lead dust exceeding safe limits in every classroom tested in Tarlac City (Manila Bulletin 2024). The campaign reframes lead safety not as an abstract environmental issue but as a children's rights issue, the right to learn in a safe environment.

At the municipal level, Quezon City and Davao City have been recognised for their efforts to safeguard vulnerable groups from lead exposure (IPEN n.d.). These cities are developing locally-driven approaches to monitoring, enforcement, and public education that could serve as models for the rest of the country. Their initiatives demonstrate that even in the absence of comprehensive national enforcement, determined local governance can make a difference.

The Philippines' Administrative Order 2013-24, which set a 90 ppm limit on lead in new residential paint sold with phase-out periods ending in 2016 and 2019, was itself a significant achievement. The country is one of only 13 in the Asia-Pacific region with confirmed legal controls on lead in paint, compared to 19 that have none, including Japan, Singapore, Malaysia, and Cambodia (ARNEC and Vital Strategies 2025). The regulation exists. The challenge now is enforcement, particularly for imported products, and extending regulatory attention beyond paint to the full spectrum of lead exposure sources.

Conclusion: Building the Case for a Lead-Safe Philippines

The evidence presented across both parts of this series is clear and confronting. Lead reaches Filipino children through every environmental medium, and once it reaches them, it causes irreversible harm to their brains, their organs, and their futures. More than half of young children tested in one Metro Manila neighbourhood showed elevated lead levels. More than nine in ten children in a flood-prone province carried lead in their hair. Imported paints labelled 'lead-free' contain more than a thousand times the legal limit for new residential paint sold. Climate change is making all of it worse.

2026 Volcano Art Prize (VAP) Entry

Artist: Paulo and Ella Mae Castro, Ages 7 and 5, School in the Philippines
Title: Lead Safe Philippines
Lead-Safety Message: Filipino and overseas researchers and NGOs are building the case for a Lead Safe Philippines, for cleaner air, safer spaces, and healthier lives.
Description of Work: Colouring pencils and pen drawing on paper.

https://volcanoartprize.com/portfolio-item/lead-safe-philippines/ [LID 29417]

Monitoring remains woefully inadequate. In Asia, the Philippines is one of only two countries that have even begun to monitor lead in children. The data that exist come not from a national surveillance programme but from the dedication of individual researchers working across the archipelago, often with limited funding and institutional support. The absence of systematic monitoring means that the

true scale of lead exposure in the Philippines is almost certainly larger than what current studies reveal.

Yet there is every reason to believe that the Philippines can lead the way in the Asia-Pacific region. The country already has stronger lead paint regulations than most of its neighbours. Its civil society organisations, particularly the EcoWaste Coalition, are among the most effective lead safety advocates in the developing world. Its researchers are producing exactly the kind of locally-grounded evidence that drives policy change. And its children are speaking up for their own right to a lead-safe environment.

Bangladesh offers a powerful precedent. When Stanford researchers found lead chromate contaminating turmeric in nine producing districts, the government acted swiftly with enforcement, monitoring, and public education. Within two years, the percentage of lead-contaminated spices in the market dropped from 47 per cent to zero (ARNEC and Vital Strategies 2025). The lesson is that when science, advocacy, and political will converge, rapid progress is possible.

The LEAD Group's vision of a lead-safe world by 2041 is not a fantasy. It is a target grounded in the knowledge that lead poisoning is entirely preventable. Every Filipino researcher collecting water samples from the Angat River, swabbing dust from a classroom floor, or testing imported paint in a laboratory is contributing to a body of evidence that makes inaction indefensible and progress inevitable.

The children of the Philippines deserve nothing less.

References

ARNEC (Asia-Pacific Regional Network for Early Childhood) and Vital Strategies (2025) *A Call to Action: Lead Poisoning and Early Childhood Development,* Singapore. https://arnec.net/sites/default/files/2025-03/Lead%20Factsheet%20FINAL%202.pdf [LID 29284]

EcoWaste Coalition (2025) EcoWaste Coalition raises the alarm on 20 imported paints with lead content, *Pressenza,* 13 October. https://www.pressenza.com/2025/10/ecowaste-coalition-raises-the-alarm-on-20-imported-paints-with-lead-content/ [LID 29253]

Inquirer (2013) Doctors raise alarm over kids' rising exposure to lead, diminished brain power, *Philippine Daily Inquirer*. https://business.inquirer.net/135799/doctors-raise-alarm-over-kids-rising-exposure-to-lead-diminished-brain-power [LID 29294]

IPEN (International Pollutants Elimination Network) (n.d.) Quezon City, Davao City cited for safeguarding vulnerable groups from lead exposure. https://ipen.org/news/quezon-city-davao-city-cited-safeguarding-vulnerable-groups-lead-exposure (Accessed 29 April 2026) [LID 29299]

Lead Elimination (n.d.) Sources of Lead Exposure in LMICs Other Than Paint. https://leadelimination.org/sources-of-lead-exposure-in-lmics-other-than-paint/ (Accessed 29 April 2026) [LID 29290]

2026 Volcano Art Prize (VAP) Entry

Artist: Martin, Age 6, School in the Philippines
Title: The Road of Dreams
Lead-Safety Message: The road to our dreams is built on a sustainable future. Respect Nature.
Description of Work: Pen and colouring pencils on paper.
https://volcanoartprize.com/portfolio-item/the-road-of-dreams/ [LID 29420]

Manila Bulletin (2024) Kids call for lead-free schools, *Manila Bulletin,* 3 November. https://mb.com.ph/2024/11/3/kids-call-for-lead-free-schools [LID 29300]

Moses, E and Ehireme, IA (2025) Animal exposure to lead, mechanism of toxicity and treatment strategy — a review, *Clinical Case Reports and Studies,* 9(1), pp 1–9. https://doi.org/10.59657/2837-2565.brs.25.212 [LID 29295]

Ona, LF (2010) Lead (Pb) contamination of dust from schools in an urbanized city in the Philippines, *International Journal of Environmental Science and Development,* 1(4), pp 316–319. https://www.ijesd.org/show-25-316-1.html [LID 29285]

Ostrea, EM; Ostrea, AM; Villanueva-Uy, ME; Chiodo, L; Janisse, J (2015) Alluvial and riparian soils as major sources of lead exposure in young children in the Philippines: The role of floods, *Environmental Science and Pollution Research,* 22(7), pp 5082–5091. https://doi.org/10.1007/s11356-014-3908-2 [LID 29282]

Rees, N; Fuller, R; UNICEF (2020) *The Toxic Truth: Children's Exposure to Lead Pollution Undermines a Generation of Future Potential,* 2nd edn, UNICEF and Pure Earth, New York. https://www.unicef.org/reports/toxic-truth-childrens-exposure-to-lead-pollution-2020 [LID 25885]

Villaluz-Martinez, HA; Dizon, JV; Perez, MLM; Gatcheco, FN (2012) Blood lead levels among children ages 3 to 6 years old in Caloocan City, *Philippine Scientific Journal,* 45(1), pp 3–10. https://www.herdin.ph/index.php?view=research&cid=45318 [LID 29287]

WHO (World Health Organization) (2019) Lead poisoning, *World Health Organization Fact Sheets*. https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health [LID 27999]

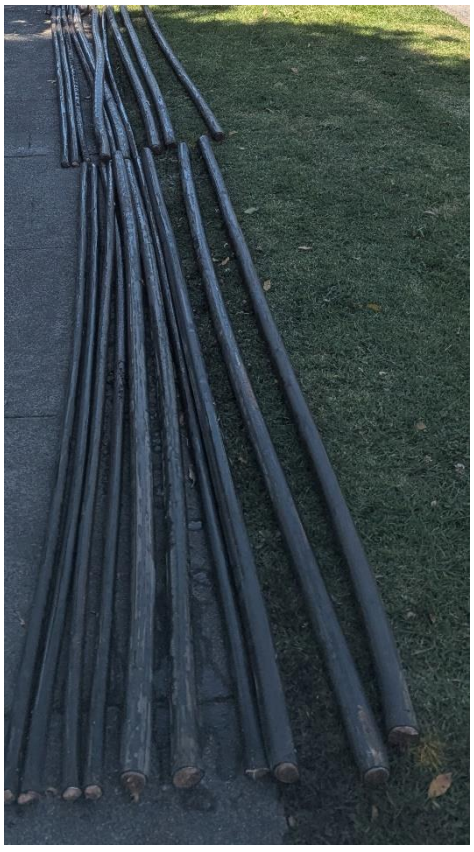
Victorian Lead Risk Work Notification Compliance and Workers Compensation Case Study

Worker health is the first casualty when "she'll be right mate" is baked in to the system

Case Details from the Worker, Questions and WebSearch Result inputs by Elizabeth O'Brien, BSc, GradDipHealthEd; Case Study and Answers collated by Claude AI for LEAD Action News*, published by The LEAD Group Inc. May 2026 [LID 29394]*
Note that LID is the Library Identifier from The LEAD Group's Library Database.

The case: known facts and timeline

This Q&A addresses notification obligations arising from the following known facts and the adequacy of the Victorian Workers Compensation system in dealing with a lead exposure case:



- **13 November 2025**: A female worker of reproductive age commences new role removing obsolete telecommunications cable for a telecommunications subcontractor in Melbourne, Victoria. The telecommunications cables were encased in lead metal or plastic sheathing, then buried in conduit. After decades underground, the lead sheathing undergoes oxidation, forming **powdery lead oxide dust on the surface of the cable**. Hauling the cables out of the manhole, by hand or using heavy machinery, cutting the lead-sheathed cables into 1.5 metre long pieces on the public thoroughfare, and loading them by hand into a bin on a flatbed truck for transport to the scrap metal recycling facility disperses lead oxide dust further. Lead dust contaminates workers' overalls, gloves and boots, is tracked into the truck cabin during transit to job sites, the recycler, and back to base, and spreads by secondary contact throughout the work environment.

- **Before 13 November 2025**: This work is a defined **lead process** under Regulation 178(a) of the Victorian OHS Regulations — *"work that exposes a person to lead dust or lead fumes arising from the manufacture or handling of dry lead compounds"* — and constitutes *"lead-risk work"* (meaning work performed in a lead process that is reasonably likely to cause the blood lead level of the employee to exceed, for a woman of reproductive capacity, 0.24 µmol/L (5 µg/dL)) under Reg 193(2)(a). The employer was required to arrange health monitoring — including a baseline medical examination and biological monitoring (blood lead testing) — **before the worker started lead-risk work** (Reg 196(1)). The employer's

arrangement of a blood test on 18 November 2025 demonstrates it was aware of this obligation — yet it failed to act before commencement. Biological monitoring was not explained as required by Lead Compliance Code, and the employer did not explain the likely rise in blood lead levels to the employee. — **Pre-commencement monitoring: not done**

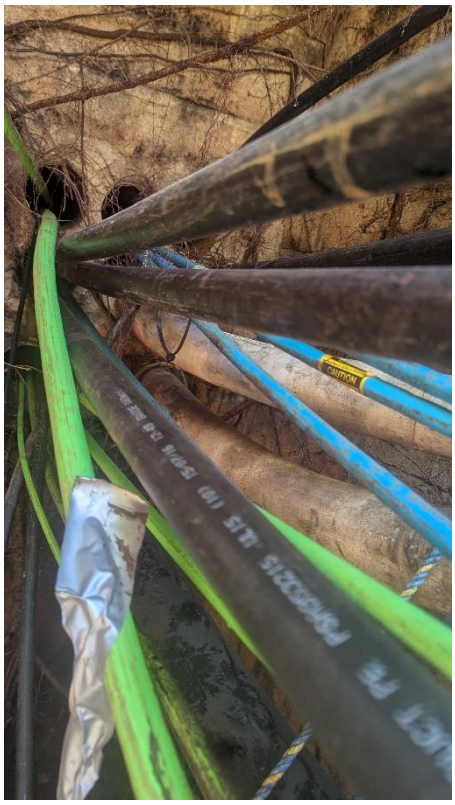
- **18 November 2025**: Blood collected — four work days after commencement — for the worker's baseline biological monitoring. The employer's arrangement of this test confirms awareness of its monitoring obligation. The blood lead level (BLL) result: **2.3 µg/dL (0.11 µmol/L)** — below the 5 µg/dL lead-risk work threshold but confirming lead absorption had already begun after only four days of work. The Victorian Code of Compliance for Lead states:

> *Employers **must** arrange health monitoring for employees who will be engaged in the work, before they start. They **must** also arrange follow up biological monitoring for employees **within a month** of the work starting, and ongoing. Medical examinations must be done by a registered medical practitioner (preferably trained in occupational medicine), and biological monitoring must be done under the supervision of a registered medical practitioner. An employer must provide the medical practitioner who is to conduct a medical examination with details of:*
>
> *• the name and address of the employer*
>
> *• the name and date of birth of the person to be examined*
>
> *• the lead process the person is engaged in, and*
>
> *• the period the person has been engaged in that process.*
>
> *Employers must also ensure that the medical practitioner provides a report setting out:*
>
> *• the dates of medical examinations and blood sampling*
>
> *• the results of biological monitoring and any other tests undertaken*
>
> *• the name of any pathology service used*
>
> *• the details of any opinion formed by the medical practitioner after the medical examination.*

At the start of employment, the employer required the employee to book and pay for a pathology test, and the employee underwent a walk-in blood test at a pathology clinic on 18 Nov 2025. The only information the employee provided in the pathology suite was her name and DOB, no examination occurred, and no report was issued.

The 18 Nov 2025 blood lead test, for which the BLL result was **2.3 µg/dL**, was meant to be done before the worker engaged in lead risk work and was meant to be followed by repeat blood lead testing **one month after starting lead risk work** (Table 1A, Reg 198(1A)) — next test due approximately 13 Dec 2025. This was the **only health monitoring action the employer took in the entire course of the worker's employment**. The result of the

later blood lead result, just over one month after commencing lead-risk work, indicates that the OHS Regulations' requirement to monitor blood lead for the second time one month after lead risk work commences is **inadequate** for the purpose of protecting workers from lead exposure. The LEAD Group always advises lead workers to obtain a blood lead result one to two weeks into the job, or sooner, depending on their sense of whether any lead could possibly be getting into them at work. The LEAD Group recommends each Australian state and territory amend their OHS Regulations to ensure lead-risk workers are blood lead tested for the second time one to two weeks into the lead-risk work. Had this amendment already been in force, this case may have been entirely prevented.



Early December 2025. The worker's symptoms, starting in early Dec 2025, and increasing in frequency and severity throughout the New Year and into 2026 were:

- Extreme fatigue, lethargy and decreased muscular endurance
- Erratic sleep patterns and insomnia
- Frequent, very intense headaches that last the whole day
- Frequent vertigo and headspins, while moving, getting up, and sitting still
- Brain fog and difficulty concentrating
- Stuttering and losing the "thread" of conversations
- Frequent intense nausea, coupled with frequent diarrhoea
- Noticeable weight loss - approximately 10% of total body mass
- Marked increase in debilitation during hot weather
- Marked, constant tremors in hands that become very intense when fatigued

- **18 December 2025**: The worker, feeling very unwell with wide ranging and recurring symptoms, attended her GP and was referred for an extensive clinical workup — iron studies, gluten antibodies, thyroid and liver function, varying disease and other blood markers — to investigate the cause of her symptoms, including a repeat blood lead test. This test was initiated by the worker for clinical reasons; **it was not arranged by the employer**. The elevated blood lead level was the only significant change found across all tests compared with earlier blood marker results (worker's email to The LEAD Group, 2 April 2026). BLL result: **18.6 µg/dL (approximately 0.90 µmol/L)** — an EBLL nearly four times the lead-risk work threshold and nearly twice the removal threshold for a woman of reproductive capacity. The rise of 16.3 µg/dL in approximately 30 days reflects very heavy ongoing lead absorption throughout the month of mid-November to mid-December 2025.

- **22 December 2025**: Pathology laboratory notified the worker's GP of the 18.6 µg/dL result. The pathology report included: Workplace exposure: The laboratory was required to notify the Department of Health within 5 days — i.e., by **27 December 2025**. There is no reason to suspect that the lab did not notify Vic Health on the same day they notified the GP – 22 December 2025.

- **6 January 2026**: The worker and, later that day, the employer became aware of the 18.6 µg/dL result. The worker informed the employer directly of it, in writing. The employer was immediately required to: (a) remove the worker from lead-risk work; (b) notify WorkSafe Victoria; and (c) arrange a medical examination within 7 days and follow-up blood lead testing in 6 weeks.

- **6 January 2026 (evening)**: Employer told the worker there was no more work for her the next day, and promised updates on the situation after talking to management. The employer did not formally remove her from lead-risk work, did not arrange a medical examination or repeat blood lead testing at the required frequency of 6 weeks (ie by 29 Jan 2026), and did not (to the worker's knowledge) notify WorkSafe Victoria that the worker, in response to her Dec 2025 pathology report stating that removal from lead risk work was mandatory, had been removed from lead risk work by the employer. **This was the last contact between the employer and the worker.**

- **13 January 2026**: The worker submitted a Workers Compensation Claim.

- **9 February 2026**: The insurer sent a letter requesting an assessment of the worker, to an Independent Medical Examiner (IME), attaching the 18 December 2025 high blood lead level pathology report but nevertheless stating that: "[the worker] reports noticing physical symptoms for some time, nausea, vertigo, brain fog and fatigue and proceeded to have full blood work where she **alleges** it was identified **high lead levels** were found." The insurer's letter did not state that the employer alleged anything, but did state: "Employer has concerns with liability as none of her symptoms were reported [to him] or witnessed [by him]." Could such framing by the insurer have persuaded the IME to disbelieve the worker?

- **19 February 2026**: The worker was assessed in the consulting rooms of an Independent Medical Examiner (IME), organised and paid for by the insurer.

- **20 February 2026**: Blood was collected for third BLL result: **7.7 µg/dL (approximately 0.37 µmol/L)** — arranged by the worker, **not the employer**, with whom the worker had no contact since 6 January 2026. The BLL is still above the 5 µg/dL return-to-work threshold. Monitoring interval of 9+ weeks exceeded the required 6-weekly frequency. It is not known on what date the result was given by the GP to the worker but a standard timeframe is the Department of Health would have been notified and the GP would have received this result three business days after blood collection and since the result was still too high for the worker to return to lead risk work, hopefully the GP would have advised the worker on the day the result was received, or shortly thereafter, and the Victorian Department of Health would have notified WorkSafe Victoria that this worker's BLL was still above the return to lead risk work level.

- **23 February 2026**: The IME submitted his report on the worker to the insurer.

- **26 February 2026**: The insurer rejected the Workers Compensation Claim citing the IME's statement that the worker had lead exposure at work but not lead poisoning, and concluding that this was not a compensable injury under the relevant Act.

Sources: OHS Regulations 2017 Version 016 (effective 26 November 2024); WorkSafe Victoria Lead Compliance Code (April 2022, Edition 1); WorkSafe Victoria Notification of Lead-Risk Work form FOR569 (August 2024); WorkSafe Victoria Safety Alert: Lead-based Paint Removal (20 January 2025); WorkSafe Victoria 'Are you performing lead-risk work?' (reviewed 4 May 2023); WorkSafe

Victoria 'Lead at work: Legal duties' (reviewed 31 July 2022); WorkSafe Victoria 'Blood lead testing schedule' (April 2024); WorkSafe Victoria 'New silica-related diseases now proclaimed' (reviewed 29 July 2022); WorkSafe Victoria Lead hub page (last reviewed 23 April 2024); health.vic.gov.au/environmental-health/lead-and-human-health (3 October 2025); worker's emails to The LEAD Group, 20 Feb 2026, 2 Apr 2026 and 4 May 2026 which included the BLL reports, IME's 26 Feb 2026 report, the insurer's 9 Feb 2026 letter to the IME, etc.

Q1. Is lead-sheathed cable removal a lead process and lead-risk work under the OHS Regulations?

Yes, on both counts.

Regulation 178 of the OHS Regulations defines **lead processes**. The applicable categories include: *"work that exposes a person to lead dust or lead fumes arising from the manufacture or handling of dry lead compounds"* (Reg 178(a)) and *"dry machine grinding, discing, buffing or cutting by power tools of lead or alloys containing greater than 5% by weight of lead metal"*. Lead-sheathed telecommunications cables are structural lead metal. After decades underground, the lead sheathing oxidises to form powdery lead oxide dust — a dry lead compound — on its surface. Cutting, hauling, loading, and transporting these cables disperses that dust. The work falls within both Reg 178 categories, and WorkSafe also has the power to determine any process to be a lead process (Reg 178, final item).

The contamination pathway is particularly insidious. Lead oxide dust forms passively on aged sheathing before cutting begins. Cutting and handling release further dust, which contaminates workers' overalls, gloves, and boots and spreads into the truck cabin during transport. The

Compliance Code (April 2022, para. 101) specifically requires employers to ensure employees **do not carry lead outside the workplace on their bodies or clothing**.

A lead process is lead-risk work for a female worker of reproductive capacity if it is reasonably likely to cause her BLL to exceed 5 µg/dL (Reg 193(2)(a)). The worker's BLL of 18.6 µg/dL after only 35 days (24 workdays) proves this conclusively. Under Reg 194(4), if an employer cannot determine whether a lead process is lead-risk work, **it must be treated as lead-risk work** until the employer establishes otherwise.

On 20 January 2025, WorkSafe issued a Safety Alert (worksafe.vic.gov.au/safety-alerts/lead-based-paint-removal) identifying employers who had committed every breach that occurred in this case. The Safety Alert was publicly available nearly a year before this worker started.

Q2. What health monitoring obligations applied, and how were the tests arranged?

The employer arranged only **one** of the three blood tests — and that test was four days late. This selective compliance is more serious than total ignorance: the employer knew its obligations yet failed to act before commencement, notify WorkSafe of the lead-risk work (as far as was able to be determined by the worker asking the employer for a copy of the notification to WorkSafe Victoria and being refused), implement controls, or arrange any further monitoring after November 2025.

- **Reg 196(1) — pre-commencement monitoring**: Must be arranged **before the employee starts lead-risk work**. Blood test arranged on 18 November 2025 — four days after commencement. — **Breach: done 4 days late**
- **Reg 196(2) — follow-up within one month**: Must be arranged within one month of commencement (deadline: 13 December 2025). The 18 December 2025 test was arranged by the worker/GP for clinical reasons — 5 days overdue and not employer-initiated. — **Not done by employer**
- **Reg 198(1A) Table 1A — 6-weekly monitoring once BLL ≥ 5 µg/dL**: Required every six weeks after the 18.6 µg/dL result. No further employer contact after 6 January 2026. The 20 February 2026 test was arranged independently, 9+ weeks later. — **Not done by employer**
- **Reg 200 — medical examination within 7 days of removal**: Employment was ended rather than formal removal; no further employer contact. — **Not done**

Had the employer arranged the Reg 196(2) one-month follow-up test by 13 December 2025, the rapidly rising BLL would have been detected as soon as that result was reported to the worker and notified to the Department of Health Victoria.

Q3. What were the key blood lead thresholds applicable to this worker?

The following thresholds have applied to female workers of reproductive capacity working in lead risk

work in Victoria since 5 June 2020:

- **5 µg/dL (0.24 µmol/L) — Lead-risk work definition threshold** (Reg 193(2)(a)) and monitoring frequency trigger: BLL ≥ 5 µg/dL requires 6-weekly monitoring (Table 1A).
- **10 µg/dL (0.48 µmol/L) — Removal threshold** (Reg 199(1A), Table 2): employer must **immediately** remove the worker from lead-risk work.
- **5 µg/dL (0.24 µmol/L) — Return-to-work threshold** (Reg 201(3A), Table 3): BLL must be below this level AND a medical practitioner must certify fitness. At 7.7 µg/dL on 20 February 2026, the worker remained above this threshold.

Thresholds for women of reproductive capacity are significantly lower than for other workers (removal: 10 µg/dL vs 30 µg/dL; return: 5 µg/dL vs 20 µg/dL), reflecting the particular risk that lead poses to reproductive health and foetal development.

Q4. What notifications to WorkSafe Victoria were required, and by whom?

(a) **Regulation 195 — notification of lead-risk work (within 7 days):**

The employer must notify WorkSafe in writing within 7 days of identifying lead-risk work, using form FOR569 (August 2024). The employer's arrangement of the 18 November 2025 blood test demonstrates it had identified the work as lead-risk work — yet, to the knowledge of the worker, he never submitted FOR569. The notification deadline was **20 November 2025** at the latest. There is no evidence the notification was ever made.

The most applicable checkboxes on FOR569 are: *"Any work which exposes a person to lead dust in air or lead fumes arising from the manufacture or handling of dry lead compounds"* and/or *"Dry machine grinding, discing, buffing or cutting by power tools of lead or alloys containing greater than 5% by weight of lead metal."*

(b) **Regulation 203 — biological monitoring results to WorkSafe after removal:**

Once an employer removes a worker from lead-risk work under Reg 199, it must send the biological monitoring results to WorkSafe as soon as reasonably possible (Reg 203(2)). The employer did not formally remove the worker, he just told her there was no work for her tomorrow then never contacted her again, so Reg 203 was not technically triggered — but failing to remove a worker whose BLL far exceeds the removal threshold is itself a breach of Reg 199. The employer may never have sent any blood lead results to WorkSafe under any provision.

Q5. What notification to the Department of Health was required, and by whom?

Under the **Public Health and Wellbeing Amendment Act 2022 (Vic)** and the **Public Health**

and Wellbeing Regulations 2019 (Vic) (as amended 1 April 2025), pathology laboratories are required to notify the Department of Health of any BLL greater than 5 µg/dL within **5 days of initial diagnosis**. Since 1 September 2018 GPs are no longer required to notify. The laboratory notified the GP and the Victorian Department of Health on 22 December 2025; though the notification deadline to the Department was on or before **27 December 2025**.

Note: The Public Health and Wellbeing Regulations 2009 (Vic) were replaced by the Public Health and Wellbeing Regulations 2019 (Vic), which are the current operative regulations as at December 2025. The Victorian Department of Health webpage 'Lead and human health' (3 October 2025) — the source for the substance of the notification obligation summarised above — references the 2009 Regulations and the 1 September 2018 amendments without naming a specific regulation number; readers seeking the precise regulation citation should consult the consolidated PHWR 2019 directly at legislation.vic.gov.au.

Q6. What is the Department of Health required to do once notified?

Once notified by a laboratory of a BLL above 5 µg/dL, the Victorian Department of Health may contact the individual or their GP to help identify the source of exposure, provide guidance to prevent further exposure, and track notified cases to identify broader trends. (health.vic.gov.au/environmental-health/lead-and-human-health, 3 October 2025). These response actions appear discretionary rather than hard statutory duties.

Note: The Department's powers in respect of notified conditions of public health significance are set out in Part 8 of the Public Health and Wellbeing Act 2008 (Vic), which includes powers of investigation, examination, and exposure-prevention direction. Whether the Department has a statutory obligation — as distinct from a discretionary power — to refer workplace lead poisoning cases to WorkSafe Victoria is not addressed on the Victorian Department of Health 'Lead and human health' webpage (3 October 2025) and may require direct enquiry to the Department's environmental health unit.

Q7. What workplace hygiene controls were required, and were they provided?

Given the nature of lead-sheathed cable removal — lead oxide dust forming passively on aged lead sheathing inside plastic conduit, spreading through being dragged out of its tight-fitting plastic conduit by a skid steer - a little digger - on maximum revolutions, thus creating a lot of friction, then cutting and handling the lead-sheathed cabling and throwing each 1.5m length of lead-sheathed cabling into a bin on a truck, driving in the dusty truck cabin which was the only place to store drink bottles and food, then unloading each piece of cabling at the scrap metal recyclers, with lead constantly contaminating clothing, gloves, boots, machinery, tools and equipment and the truck cabin — the hygiene controls required by Part 4.3 of the OHS Regulations and the WorkSafe Lead Compliance Code (April 2022) were of critical importance. Based on available information, only the hand-washing station and appropriate soap, not the showering or changing facilities required in the first of the following and belated laundering of contaminated work clothing (after it had been reworn a

few days) appear to have been provided.

- **Hand and face washing facilities**: Employers must provide and maintain washing and changing facilities (Reg 191; Compliance Code para. 113). Workers must wash hands and face after leaving a lead process area and before eating, drinking, or smoking (Reg 205(3)). Appropriate soap capable of removing lead from skin is required. The workers had hand washing stations on the trucks with D Lead soap.

- **Separate eating and drinking area**: Employers must provide an eating and drinking area that cannot be contaminated with lead from any lead process (Reg 190(2); Compliance Code para. 110). Eating, drinking, chewing gum, or smoking in any lead process area is prohibited (Reg 190(1); Reg 205(1)). Instead of these provisions, the workers' food and drink were carried inside the cabin of the lead process vehicles where workers wore contaminated overalls and boots, and placed tools that had been used in lead processes.

- **Meal breaks away from the lead work area**: The prohibition on eating in a lead process area combined with the requirement to provide a separate eating area necessarily implies that workers must be given meal breaks during which they can leave the lead work environment, wash, and eat in an uncontaminated area. A continuous shift of 7:00 to 15:30 (8.5 hours) with no meal break would deny the worker these legal entitlements and is inconsistent with the employer's duties under Regs 190 and 191 and OHS Act s21.

- **Eating before commencing lead work**: WorkSafe Victoria does not explicitly state that workers should be advised by their employer to eat a meal before commencing their daily lead work shift. However, The LEAD Group contends that this is an oversight in the lead Compliance Code because standard occupational health guidance for lead workers recommends eating before starting work, (and at standard meal-times that occur during the shift) as food in the stomach raises gastric pH and substantially reduces the absorption of ingested lead through the gastrointestinal tract. A worker arriving fasting at 7:00 am and working through to 15:30 without a designated lead-dust-free meal break would be particularly vulnerable to gastrointestinal lead absorption throughout the shift, especially if she had not been explicitly advised to eat before starting work each day.

- **Laundering of contaminated work clothing**: Employers must arrange laundering or disposal of protective clothing contaminated with lead dust (Reg 192(1); Compliance Code paras. 117–122). Contaminated clothing must not be taken home (Reg 192(2)).

- **Containment of lead contamination in the truck cabin**: The Compliance Code (para. 101) requires employers to ensure that employees do not carry lead outside the workplace on their bodies or clothing. Where workers travel to and from job sites in contaminated clothing in the same vehicle, this requires at minimum that workers change before entering the cab, and that the cab is regularly cleaned by wet methods or Class M/H vacuum. The workers were not informed of this requirement and only removed plastic outer gloves before driving the trucks, wearing the contaminated overalls, inner gloves and gumboots while driving. The worker was not informed of the necessity of decontaminating the lead process truck, was not provided or shown any lead cleaning equipment, and never cleaned any part of the truck in any way during the entire employment.

- **Employers must ensure that any lead contamination is confined, so far as is reasonably practicable, to the area where the lead process is carried out:** Workers walked straight into the site office after shift in contaminated overalls and gumboots before changing. The 'clean' clothes and shoes the workers arrived at site in were stored in the same

site office during shift. No containers were provided for the clean clothes and shoes, clothes were hung from the same window frames the lead contaminated overalls were hung from. Shoes were stored on the floor which workers walked over with lead contaminated gumboots. The employer never mentioned the risk of cross contamination, or made any effort to keep the contaminated PPE separate from the everyday clothes. Contaminated overalls and gloves were stored in open laundry baskets waiting for laundering for days running in the site office, next to the open laundry baskets which held laundered PPE. No sealed containers were provided for respiratory equipment, as required by the Lead Compliance Code. The respirators were never cleaned, nor was any maintenance schedule explained.

- **Employers shall: provide and maintain, so far as is reasonably practicable, changing and washing facilities for employees.** No changing or washing facilities other than the single site toilet were made available. Therefore the female worker changed inside the sole toilet cubicle at start and end of shift. Washing of hands with D Lead soap was performed at the cubicle sink. The only other sink was inside the site kitchen. The worker was never instructed to decontaminate the toilet cubicle in any way after changing lead contaminated clothing there.

Q8. What is the significance of the worker's symptoms and the clinical findings?

WorkSafe Victoria's guidance lists two tiers of health effects from lead absorption.

The **early signs and symptoms of high lead levels**, as listed in the WorkSafe Victoria Lead hub page (last reviewed 23 April 2024), *can include*: headaches; tiredness; irritability; nausea; stomach pains; anaemia (a condition where there are not enough red blood cells or oxygen-carrying haemoglobin in the blood, resulting in paleness and weariness); and weight loss. The WorkSafe Lead Compliance Code (April 2022, para. 12) lists the same early signs and symptoms with the exception of weight loss.

The **more serious conditions caused by continued lead exposure**, as listed in both sources, can include: kidney damage; nerve and brain damage; lead palsy (a type of paralysis of the extensor muscles of the forearm); and death. The WorkSafe Lead hub page also specifically states: "A developing unborn child is particularly at risk from exposure to lead, especially in the early weeks of pregnancy. Lead can pass from a mother to her unborn child. Lead can damage a developing baby's nervous system as well as affect behaviour and intelligence."

The worker's own description of her symptoms, in a timeline she sent to The LEAD Group (worker's emails to The LEAD Group, 7 January 2026, 2 April 2026 and 24 May 2026), is that her symptoms began in early December 2025 and increased in frequency and severity through the New Year and into 2026. The worker first attended her GP on 16 December 2025 not knowing what could be making her so unwell and went for extensive blood testing on 18 December 2025 because she was feeling very unwell. Her ten reported symptoms, in her own words, are listed below, followed by a comment identifying which of the cited sources record each as a recognised effect of lead absorption.

The two principal Australian regulatory sources cited throughout this Case Study — the WorkSafe Victoria Lead Compliance Code (April 2022, para. 12) and the WorkSafe Victoria Lead hub page (last reviewed by WorkSafe Vic on 23 April 2024) — together list only seven early signs and symptoms of

high lead levels. The LEAD Group's own Fact Sheet, Health Impacts of Lead Poisoning (Vella et al 2020), draws on 64 peer-reviewed sources and lists many additional adult symptoms not captured in the WorkSafe lists. Where a worker's symptom is not in WorkSafe but is in Vella et al 2020, the Vella et al sub-section is identified below.

1. "Extreme fatigue, lethargy and decreased muscular endurance." Fatigue ("tiredness") is one of the seven early signs and symptoms listed in both WorkSafe sources. Vella et al 2020 specifically lists "Fatigue, muscular exhaustion" (Adults / Behaviour, citing six sources), "Muscular weakness" (Adults / Bone, muscle and joint), and (in the Children section) "Impaired muscular strength and endurance" — all of which directly correspond to the worker's description. The combination of fatigue with decreased muscular endurance is the textbook adult occupational lead presentation.

2. "Erratic sleep patterns and insomnia." Sleep disturbance is not listed in either WorkSafe source. Vella et al 2020 lists "Sleep disturbance, insomnia" (Adults / Behaviour). The worker's symptom corresponds to a recognised adult lead effect outside the limited WorkSafe lists.

3. "Frequent, very intense headaches that last the whole day." Headaches are listed in both WorkSafe sources as an early sign of high lead levels, and in Vella et al 2020 (Adults / Other). The severity and duration the worker reports — whole-day headaches — is consistent with progression beyond "early signs" toward the neurological effects listed in the more serious conditions lists of both WorkSafe sources.

4. "Frequent vertigo and head spins, while moving, getting up, and sitting still." Vertigo and dizziness are not listed in either WorkSafe early signs list. Vella et al 2020 lists "Dizziness" in the Children's section (Peripheral nervous system) — a symptom that, in adults, also fits within the Adults / Nervous system effects of "Encephalopathy", "Psychomotor impairment" and "Cerebrovascular diseases" listed by Vella et al 2020. The IME himself recorded the worker's continuing complaint of vertigo, including "a spinning sensation even when she is sitting without any movement" (see Q9 below), confirming she did report this symptom to the IME during the consultation on 19 Feb 2026.

5. "Brain fog and difficulty concentrating." Cognitive impairment is not listed as an early sign in either WorkSafe source, although "nerve and brain damage" appears in both serious conditions lists. Vella et al 2020 specifically lists "Impaired concentration", "Deficits in short term memory" and "Cognitive function deficit" (Adults / Intellectual and mental). The worker's symptom is a recognised adult occupational lead effect.

6. "Stuttering and losing the 'thread' of conversations." These verbal-cognitive symptoms are not listed in either WorkSafe source. Vella et al 2020 lists "Personality changes" (Adults / Intellectual and mental) and, in the Children section, "Verbal function / linguistic deficits" — symptoms that in an adult most closely correspond to the cognitive function deficits already noted at item 5. Lead-induced disruption of verbal fluency in adults is recognised in the lead occupational health literature but is not specifically itemised by either WorkSafe source.

7. "Frequent intense nausea, coupled with frequent diarrhoea." Nausea is listed in both WorkSafe sources as an early sign of high lead levels. Vella et al 2020 (Adults / Gastrointestinal) specifically lists "Nausea" and "Constipation, diarrhoea" as adult lead poisoning symptoms. The combination of nausea with diarrhoea — rather than constipation — is consistent with the more acute end of

gastrointestinal lead toxicity in adults.

8. "Noticeable weight loss — approximately 10% of total body mass." Weight loss is listed in the WorkSafe Lead hub page (but is NOT in the WorkSafe Compliance Code's seven early symptoms — an inconsistency between the two WorkSafe sources). Vella et al 2020 (Adults / Gastrointestinal) lists "Weight loss, anorexia" as an adult lead symptom. A weight loss of approximately 10% of total body mass over a few months is clinically significant by any measure and is consistent with documented adult lead toxicity.

9. "Marked increase in debilitation during hot weather." This symptom is not specifically itemised in either WorkSafe source or in Vella et al 2020, but it is described in detail in O'Brien and Roberts (2009), an article in *LEAD Action News* titled "Heat and Dust: why lead poisoning is called the 'Summer Disease'". Freeman (1970), as quoted in O'Brien and Roberts (2009), observed that lead-poisoned children with moderately severe poisoning "may seem well during the winter months, but tend to develop symptoms during the hot summer period" and that "factors causing dehydration or acidosis, which like infections mobilize lead from the bones, may be more common in the hot weather". O'Brien and Roberts (2009) also record the direct first-person account of a 70-year-old lead-poisoned woman, a member of The LEAD Group's Lead Poisoned Adults e-group, who reported on 21 April 2009: "I have chelated for lead off and on for three years. When the levels go down, I tolerate heat. The first sign of lead levels rising, is the burning in my feet and ankles, the intolerance to heat and no endurance in any sport." That account precisely matches the worker's description of "marked increase in debilitation during hot weather". O'Brien and Roberts (2009) similarly record the account of a firearms instructor (Case G) who, while occupationally lead-exposed at a BLL of 1.68 µmol/L (35 µg/dL), reported: "When I go out into the sun, if I get a lot of UV, I know I'm going to get a lead dump. I get hot flushes — it feels like I'm spontaneously combusting from inside — my entire body heats up and breaks out into a sweat." The pattern is consistent: in lead-poisoned adults, heat exposure mobilises bone-stored lead into the bloodstream, which then exacerbates the underlying multi-system toxicity — including the autonomic, anaemic, renal and muscular sub-systems individually listed in Vella et al 2020 — producing the heat intolerance the worker describes.

10. "Marked, constant tremors in hands that become very intense when fatigued." Tremor is not listed in either WorkSafe source. Vella et al 2020 (Adults / Nervous system) specifically lists "Tremor" with six cited supporting sources — including a dedicated 2003 study by Louis et al on the association between essential tremor and blood lead concentration. The worker's symptom is a recognised adult occupational lead effect with a specific peer-reviewed evidence base.

The worker's own account confirms that she sought medical investigation because of the rapid onset and increasing severity of these symptoms. She booked the 18 December 2025 blood tests herself because of consistent nausea and intense fatigue (worker's email to The LEAD Group, 2 April 2026). The elevated blood lead level was the only significant change found across all of those blood tests compared with earlier blood marker results, making occupational lead absorption the most clinically plausible single explanation for the multi-system symptom picture she describes.

The absence of a meal break during 8.5-hour shifts, and the likelihood that the worker was fasting from before 7:00 am, would have increased gastrointestinal lead absorption throughout her employment, compounding inhalation and dermal exposure pathways and contributing to the rapid

rise in BLL from 2.3 to 18.6 µg/dL in approximately 30 days (20 workdays). The LEAD Group always advises anyone potentially being exposed to lead to eat a hearty breakfast before work or play outside and this advice should be part of each state's Compliance Code for Lead and induction for lead risk work.

Q9. What is the workers compensation claim rejection based on, and is it legally sound?

The workers compensation insurer rejected the worker's claim under the **Workplace Injury Rehabilitation and Compensation Act 2013 (Vic)** (WIRC Act, as amended 6 August 2025) on two grounds: first, that 'lead exposure' is not a compensable 'injury' under the Act's definition; and second, that the insurer's Independent Medical Examiner (IME) found the worker's symptoms were not the symptoms of 'lead poisoning'. This rejection appears to be fundamentally misconceived on multiple grounds.

The pathology report provided to the IME before the worker's consultation included the following printed guidelines for blood lead interpretation:

> *Guidelines for blood lead interpretation*
>
> *...Workplace exposure:*
>
> *Immediate removal from exposure is necessary if blood lead:*
>
> *> 9.9 µg/dL (0.47 µmol/L): Females of reproductive age*
>
> *...A worker must not return to at risk work until blood lead:*
>
> *< 5 µg/dL (0.24 µmol/L): Females of reproductive age*

The worker's result of 18.6 µg/dL was printed in red text followed by 'H' (for High). The IME therefore had the applicable removal and return-to-work thresholds in front of him before the consultation.

The IME's report contained the following direct quotes (the IME's report named the worker, but her name has been replaced throughout by "[the worker]"; his blood lead units "mmol/L" — which are wrong by a factor of 1,000 and should have been written as µmol/L — are quoted verbatim as he wrote them):

Current Symptoms (from the IME's report)

> *"[The worker] is still complaining of all these symptoms with significant ongoing vertigo and a spinning sensation even when she is sitting without any movement."*

Summary (from the IME's report)

"It is possible that [the worker] has been exposed to lead. Her whole blood level is 0.9 mmol/L. Adults with BLL less than 1.93 mmol/L are usually asymptomatic and [the worker] most likely has another alternative explanation for her symptoms. She has been exposed to lead but this would not account as lead poisoning and her symptoms are not from acute lead toxicity. She has been removed from the exposure to the lead site immediately and repeat blood tests can be done in three to six months' time to see if the blood levels are improving."

"According to the literature, BLLs of 0.48 to 2.21 mmol/L from previous exposures can be encountered without ongoing exposure. Hence, it is also possible that this was a lead exposure prior to her employment which has just showed up in the blood results, although given that her work involved exposure to lead, it is possible that her lead levels are from the work-related exposure, although her symptoms are highly unlikely to be from the lead exposure. There should be a repeat of the blood test beforehand because skin contamination is possible showing an increased lead level and one-off blood test can be a possible contamination as well. In [the worker]'s case, she has had lead exposure and not lead poisoning. If she has a repeat blood test with similar elevate BLLs, she has most likely had previous exposure."

Later in the IME's report

"Nothing further is required to achieve a full return to work."

"[The worker] has non-specific symptoms along with elevated blood lead levels accounting for lead exposure, but her current symptoms are most likely not from the lead exposure. As far as the work-related lead exposure is concerned, [the worker] has a full capacity for pre-injury employment. No further treatment is required, although her ongoing non-specific symptoms of diarrhoea, nausea, headaches and vertigo are most likely not related to lead exposure and are possible psychosomatic manifestations of underlying poor mental health."

Elizabeth O'Brien, Lead Scientist and Lead Advisor for The LEAD Group charity since 1990, has analysed the IME's report and identified the following serious deficiencies:

- an implication that, in his medical opinion, lead exposure resulting in a BLL of 18.6 µg/dL after one month of doing lead-risk work, in a female worker of reproductive capacity, does not meet the definition of lead poisoning, a compensable injury under the Workplace Injury Rehabilitation and Compensation Act 2013 (Vic);

- no acknowledgment of the mandatory guideline in the pathology report he was provided by the insurer: "A worker must not return to at risk work until blood lead: < 5 µg/dL (0.24 µmol/L): Females of reproductive age." Declaring the worker has "full capacity for pre-injury employment" as at 19 February 2026 is, frankly, negligence (both on the part of the IME and on the part of the insurer's case manager who accepted this negligent statement in the IME's report);

- no referencing for important lead information he relied on to come to his conclusions;

- clear disbelief that the worker was suffering from vertigo and a spinning sensation even when sitting. If he believed she had this symptom he could not have written: "[The worker] is **still complaining** of all these symptoms with significant ongoing vertigo and a spinning sensation even when she is sitting without any movement" in the same report as he wrote: "Nothing further is required to achieve a full return to work." What work do you know of, that can be done while suffering from vertigo and a spinning sensation even when sitting? If he believed the worker, he would have done his due diligence and at the very least referred her back to her GP for a referral to a vertigo/balance/dizzy clinic. By disbelieving the worker, the IME is effectively encouraging the GP, the insurer and anyone else who reads his report to discredit this and other things the worker says;

- zero knowledge of blood lead testing units. His 0.9 mmol/L (millimoles per litre) is equal to 900 µmol/L (micromoles per litre) — a person would be long dead from lead poisoning before they could ever absorb that much lead into their bloodstream;

- probable inability to type numbers accurately from a reference, and to include important context for what he located in his web-searching. Whereas the IME wrote: "According to the literature, BLLs of 0.48 to 2.21 mmol/L from previous exposures can be encountered without ongoing exposure," that range — with the units corrected — of 0.48 to 2.21 µmol/L converts to 10 to approximately 45.8 µg/dL. The lower end of that range (10 µg/dL) appears in hundreds of thousands of lead documents including being the WorkSafe Victoria removal threshold for women of reproductive capacity, whereas I cannot recall from the tens of thousands of documents I have read on lead, anyone specifically citing 45.8 µg/dL as being at the top end of the "concerning but not acutely toxic" blood lead range. Nevertheless, the range of 10 to 45 µg/dL is the kind of range cited when discussing endogenous re-mobilisation of bone lead — i.e. when noting that lead absorbed years earlier can leach back out of bone in to the bloodstream. Mentioning that the source of lead in blood is the worker's own bones in that case, would have been helpful for non-medical people (like the insurer's case manager) reading the IME's report and needing to decide whether to reject the worker's compensation claim;

- zero knowledge of the phlebotomist's protocol for the removal of skin lead contamination prior to venous blood collection — a critical step in ensuring an accurate blood lead result for a worker who has been handling lead-contaminated materials or indeed anyone seeking to know their blood lead level;

- faulty logic. Even if it were true that "Adults with BLL less than 1.93 µmol/L are usually asymptomatic," that does not mean that every adult with a blood lead level of less than 1.93 µmol/L (40 µg/dL) MUST be asymptomatic;

- confusion about interpretation of increasing blood lead levels in relation to contemporaneous known lead exposure, as compared to increasing blood lead levels due to lead moving from the bones into the bloodstream when there is no contemporaneous known lead exposure. Whilst it is true that blood lead levels can rise from both exogenous (e.g. occupational) lead and endogenous (bone) lead and that these two reasons for a rising blood lead level can occur at the same time, the IME made no comment on whether the worker might have been suffering from any of the conditions that can cause earlier-in-life bone-stored lead to leach into the blood. In other words, he made no comment as to whether the worker was pregnant, lactating, suffering bone loss, hyperthyroidism, calcium deficiency, immobilisation, early menopause, or any other condition typically associated with lead moving from the bones to the bloodstream. If he really believed that the lead in her blood could have been due to previous lead exposure

(now leaching from her bones), surely his duty of care would involve referring her on for investigation of that hypothesis;

- no evidence of any previous experience or knowledge of lead exposure cases, the signs or symptoms of lead poisoning, lead exposure case management, or the schedule of repeat blood lead monitoring required under Victorian OHS Regulations. By writing "She [the worker] has been removed from the exposure to the lead site immediately and repeat blood tests can be done in three to six months' time to see if the blood levels are improving," the IME demonstrates that he thinks it would be immaterial if a person's blood lead level kept rising for up to six months after the consultation date after she was removed from lead-risk work. In fact, if his hypothesis that her BLL on 18 December 2025 was due to previous (i.e. prior to her 13 November 2025 start of lead-risk work) lead exposure was correct, and the worker's BLL did keep rising for another six months from the consultation date of 19 February 2026, the IME would be liable for medical negligence for not having directed the worker to obtain an earlier blood lead result in order to determine whether the post-removal-from-lead-risk-work blood lead trend was in fact falling or rising. Obtaining a repeat BLL within two weeks following removal from lead-risk work is another LEAD Group recommendation which needs to be incorporated into OHS Regulations and Public Health follow-up of notifiable BLLs. Discovering the BLL trend in as few as three days or at most fourteen days once you think lead exposure has been ended (and also when treatment for lead poisoning has begun) is crucial to secondary lead poisoning prevention (case management after a blood lead threshold has been exceeded);

- stepping outside his area of expertise as a General Physician by making the wild accusation that the worker's ongoing symptoms "are possible psychosomatic manifestations of underlying poor mental health";

- a general shotgun approach to shooting down the worker's claim, which could only work in a broken system. The IME tried everything: ignoring or not reading the mandatory guideline in the pathology report; opining that "lead exposure" is not "lead poisoning"; applying a generalisation as if it were an absolute rule about symptoms; raising doubt about the worker's credibility, the phlebotomist's ability to follow skin-cleaning protocol, and that the lead in the worker's blood a month after starting lead-risk work was not necessarily from her occupational exposure; and suggesting repeat blood lead testing on a timeframe well outside the frequency required at this particular BLL by Victoria's OHS Regulations or even to prove or disprove the IME's poorly elucidated hypothesis as to the source of the lead in the worker's blood.

Detailed rebuttal of two of the IME's claims

The IME's report includes the assertion: "According to the literature, BLLs of 0.48 to 2.21 mmol/L from previous exposures can be encountered without ongoing exposure." (For "mmol/L" read "µmol/L" — the thousand-fold unit error already noted in Elizabeth O'Brien's analysis above.) The IME does not name any literature source for this assertion.

- The leading Australian regulatory source on the topic — Safe Work Australia's Health monitoring guide for lead (inorganic) (March 2020) — does not support the IME's claim. The number 2.21 does not appear anywhere in the document. The phrases "previous exposure", "previous exposures", "without ongoing exposure", "past exposure", "bone lead", "mobilise/mobilize", "endogenous" and "leach" do not appear. The number 0.48 µmol/L does appear, but in the directly opposite context — as the SI equivalent of 10 µg/dL, the mandatory removal threshold for females of reproductive capacity. Safe Work Australia states:

  "If it is confirmed that lead blood levels exceed 10 µg/dL (0.48 µmol/L) for female workers

of reproductive capacity … the worker must be removed from lead risk work and the workplace practices and controls should be immediately reviewed as this indicates current controls are not performing effectively."

"Females of reproductive capacity should be informed about the reproductive health risks where blood lead levels may exceed 10 µg/dL (0.48 µmol/L)."

- In other words, the lower bound of the IME's quoted range — 0.48 µmol/L — is, in Safe Work Australia's own framework, the level at which (a) the worker must be removed from lead-risk work because controls are not performing effectively, and (b) the worker must be informed of reproductive health risks. It is not, as the IME's framing suggests, a "background" level that might be encountered without ongoing exposure.

- On the implications of the worker's BLL of 18.6 µg/dL — well above 10 µg/dL — for a woman of reproductive capacity, Safe Work Australia states:

  "Research in non-occupational settings has indicated: increased risk of spontaneous abortion and potential for postnatal developmental delay at maternal blood lead levels greater than or equal to 5 µg/dL; hypertension and kidney dysfunction at blood lead levels greater than or equal to 5 µg/dL; reduced birth weight and potential for subclinical neurocognitive deficits at maternal blood lead levels greater than or equal to 10 µg/dL…"

- At 18.6 µg/dL, the worker was approximately four times the 5 µg/dL threshold for increased risk of spontaneous abortion, postnatal developmental delay, hypertension, and kidney dysfunction, and approximately twice the 10 µg/dL threshold for reduced birth weight and subclinical neurocognitive deficits — even in non-occupational settings, where ambient exposure is generally lower than in lead-risk work.

On the IME's separate claim that "Adults with BLL less than 1.93 mmol/L are usually asymptomatic" (units corrected: less than 1.93 µmol/L or less than 40 µg/dL), no source is cited. Safe Work Australia does mention 40 µg/dL but says something quite different — and in the opposite direction:

"It is possible for people with blood lead levels of 40 µg/dL or more not to exhibit noticeable health effects."

"Blood lead levels where people exhibit symptoms vary greatly between individuals."

Safe Work Australia's point is that the relationship between BLL and symptoms is highly variable between individuals — even at 40 µg/dL or above, some people happen not to exhibit noticeable health effects. The IME has inverted this: he has converted "some people at 40 µg/dL or above may still be asymptomatic" into the categorical claim that "adults with BLL less than 40 µg/dL are usually asymptomatic." These are not the same statement, and Safe Work Australia explicitly cautions against treating BLL-symptom relationships as general rules. Safe Work Australia also lists 30 µg/dL as the threshold for "increased non-specific symptoms" — meaning symptoms are expected to increase as BLLs approach the worker's range, not be absent below 40 µg/dL.

The IME's report cites no source for the "1.93 µmol/L (40 µg/dL) usually asymptomatic" claim. Two Australian regulatory sources have been searched for the claim, and a peer-reviewed review of the lead literature directly contradicts the IME's framing:

(1) Safe Work Australia's Health monitoring guide for lead (inorganic) (March 2020) — 1.93 does not appear; the closest statement is that some people at 40 µg/dL or above may not show noticeable health effects, the inverse of the IME's claim.

(2) Austin Health Toxicology Services Lead Guideline (Version 3, published August 2025) — 1.93 does not appear; "asymptomatic" does not appear; the IME's framing of "BLLs of 0.48 to 2.21 mmol/L from previous exposures … without ongoing exposure" does not appear. Austin Health's adult action-BLL thresholds are at 0.48, 2.4, 3.4 and 4.5 µmol/L (10, 50, 70 and 100 µg/dL) — and at 0.48 µmol/L the recommendation is "Remove from source; repeat concentration in a month; chelate if symptomatic." In other words, Austin Health, like Safe Work Australia, treats a BLL above 0.48 µmol/L (10 µg/dL) as a level requiring action — not as a "background" level associated with past exposure.

Sanders et al (2009), who reviewed 200 articles on lead, specifically state that neurotoxicity symptoms of lead can begin in adults at blood lead (BPb) levels below 18 µg/dL:

> *"A remarkable explosion in the literature about the health effects of lead has occurred since the dissemination of U.S. Occupational Safety and Health Administration (OSHA) lead standards in 1993 (OSHA 1993a,b) stating that workers can attain blood lead levels up to 40 µg/dL for their working lifetime. Since then, many longitudinal studies have provided evidence that cumulative lead dose causes cognitive dysfunction or decline (reviewed in Shih et al 2007). The neurotoxic effects of lead in workers can be induced at BPb levels below 18 µg/dL, somewhat higher than the critical level of lead neurotoxicity in children (5 µg/dL) (Murata et al 2009)."*

However, the Austin Health Toxicology Services Lead Guideline (August 2025) is itself substantially out of date with respect to Victorian occupational lead-risk work. Although reviewed in August 2025 — five years after the Victorian OHS Regulations 2017 were amended on 5 June 2020 to introduce a 10 µg/dL removal threshold for women of reproductive capacity and a 30 µg/dL removal threshold for all other workers — the Austin Health guideline footnotes that "Occupational exposure guidelines recommend removal from source if conc. > 20 µg/dL (0.96 µmol/L)." This is the pre-2020 Victorian threshold, it does not differentiate workers by gender, and it is therefore inconsistent with the current Victorian OHS Regulations. A treating clinical toxicologist who relies on this guideline for advice about a female worker of reproductive capacity in lead-risk work would risk repeating the same error as the IME — treating BLLs that are above the Victorian removal threshold as if they were below it.

This out-of-date guidance is of immediate concern in this worker's case because she was referred by her GP to Austin Health Toxicology Services. If the consulting toxicologist there relies on this guideline, the advice [the worker] receives (if she attends the service) may be at variance with the Victorian OHS Regulations that should govern her clinical management. The LEAD Group recommends that Austin Health update its Lead Guideline to reflect the current Victorian OHS Regulations (and the corresponding regulations in other Australian jurisdictions).

Where to find a more lead-knowledgeable Independent Medical Examiner

Given the IME's apparent lack of experience with lead exposure cases — evidenced by the unit error, the unsourced quantitative claims, and the absence of any reference to Victorian OHS-specific blood lead action levels for women of reproductive capacity — The LEAD Group recommends that workers compensation insurers, workers and their advocates seeking a medical opinion consult the Australasian Faculty of Occupational and Environmental Medicine (AFOEM) "Find a Consultant" directory, which lists nine Victorian doctors as at May 2026. AFOEM is a faculty of the Royal Australasian College of Physicians and does not publish its own lead guidelines; its members are expected to follow the Safe Work Australia Inorganic Lead Guidance and the NHMRC Managing Individual Exposure to Lead in Australia Guide. An AFOEM-listed consultant is therefore the most likely first port of call for a Victorian workers compensation insurer or worker seeking medical advice that is both occupationally informed and current with Australian regulatory thresholds.

Q10. On what grounds should the workers compensation claim have been accepted

Ground 1: **Lead poisoning is a proclaimed disease — the burden of proof is reversed**

Most critically, **"lead poisoning or its sequelae"** is a **proclaimed disease** under the WIRC Act. WorkSafe Victoria's own guidance explains the effect: "A worker, or a dependant of a worker, with a proclaimed disease are entitled to compensation **irrespective of whether work is proven to have contributed to the disease**, unless WorkSafe or a self-insurer **proves that the disease was not due to employment."** (WorkSafe Victoria, 'New silica-related diseases now proclaimed', reviewed 29 July 2022, worksafe.vic.gov.au/new-silica-related-diseases-now-proclaimed)

The current Victorian proclaimed diseases list on that page includes: **"Lead poisoning or its sequelae."** The workers compensation insurer — not the worker — therefore bears the burden of proving the lead poisoning or its sequelae was not due to her employment. Given that the worker's BLL rose from 2.3 µg/dL (her first-ever blood lead test, shortly after commencing lead-sheathed cable removal) to 18.6 µg/dL in only 35 days, and that the elevated BLL was the only significant change in an extensive clinical workup, this is an extremely high burden to discharge.

Ground 2: **The IME's own diagnosis falls within the OHS Regulations' category of 'excessive lead absorption' — and is covered by 'sequelae'**

The OHS Regulations draw a precise distinction between outcomes a medical practitioner must assess when examining a worker (Reg 202(2)):

- (b) the worker **"has excessive lead absorption and must not perform lead-risk work"**
- (c) the worker **"shows symptoms or signs of clinical lead poisoning and is unfit to work"**
- (e) the worker **"is fit to continue performing lead-risk work"**

These are **two distinct, separately defined categories**. Category (b) — excessive lead absorption — does not require clinical lead poisoning symptoms. The insurer's IME, by diagnosing 'lead exposure' while finding no 'acute lead toxicity' symptoms, was effectively making a Reg 202(2)(b) finding: **excessive lead absorption** — a defined, regulated, actionable condition under Victorian OHS law, not an absence of injury. A BLL of 18.6 µg/dL — nearly twice the mandatory removal threshold for women of reproductive capacity — is by definition excessive lead absorption.

Furthermore, the proclaimed disease is 'lead poisoning ***or its sequelae***.' Excessive lead absorption causing a BLL of 18.6 µg/dL, accompanied by the symptoms the worker reported — **nausea**, **fatigue**, vertigo, brain fog, and **upset stomach** — is a sequela of lead poisoning. The IME cannot escape the proclaimed disease framework by characterising the condition as category (b) rather than category (c) when the proclaimed disease expressly covers sequelae.

Ground 3: **WorkSafe Victoria does not define 'lead poisoning' by a specific BLL threshold**

Nowhere in the OHS Regulations, the Compliance Code, or any WorkSafe Victoria guidance do the uploaded documents define 'lead poisoning' as requiring a specific blood lead level. The removal threshold of 10 µg/dL for women of reproductive capacity is not labelled 'lead poisoning' — it is simply the level at which removal is mandatory. WorkSafe's own hub page describes lead as *"a cumulative poison"* that *"can build up in the body over time until symptoms occur"* — language directly

applicable to the worker's trajectory from 2.3 to 18.6 µg/dL over 30 days. The insurer's IME has drawn a definitional line — 'lead exposure' vs 'lead poisoning' — that WorkSafe Victoria itself has not drawn in its legislation or published guidance.

Ground 4: **Additional independent grounds**

- The WIRC Act definition of 'injury' independently includes **disease contracted in the course of employment**. Occupational lead absorption causing a BLL of 18.6 µg/dL and associated symptoms constitutes an occupational disease under this definition, independently of the proclaimed disease provision.
- The insurer's IME confirmed lead exposure occurred — confirming lead was absorbed into the worker's body in the course of her employment.
- The employer's own arrangement of the 18 November 2025 blood test is an implicit acknowledgement that it knew lead-risk work was occurring.
- The WIRC Act was amended on 6 August 2025 — approximately three months before the worker commenced — to improve support for injured workers accessing the WorkCover Scheme.
- The employer's multiple OHS Regulation breaches — no pre-commencement monitoring, inadequate controls, no meal breaks away from lead work, no removal at the 10 µg/dL threshold, (evidently) no WorkSafe notification, and complete abandonment after 6 January 2026 — created the conditions for the worker's harm and are directly relevant to the insurer's ability to prove the disease was not due to employment.

Q11. Is the employer's conduct consistent with a pattern WorkSafe has already identified?

Yes. WorkSafe Victoria publicly identified exactly this pattern of breaches before this worker commenced employment.

On **20 January 2025**, WorkSafe's Safety Alert identified employers who had committed every breach that occurred here. (worksafe.vic.gov.au/safety-alerts/lead-based-paint-removal)

On **24 May 2022**, WorkSafe warned of "potentially deadly risks" after finding unsafe practices at 11 workplaces, including three not providing required biological monitoring. (worksafe.vic.gov.au/news/2022-05/lead-safety-breaches-prompt-warning)

The employer's arrangement of the 18 November 2025 blood test — four days late — demonstrates selective awareness of obligations. Yet it may have failed to notify WorkSafe, and failed to implement any hygiene controls, provide meal breaks, arrange the one-month follow-up test, or take any action upon the 18.6 µg/dL result other than ending the worker's employment and ceasing all contact. This is not ignorance — it is selective compliance followed by abandonment.

Q12. Summary — what notifications and actions were required, by whom, and what happened?

- **Employer → WorkSafe Victoria (Reg 195)**: Notify of lead-risk work within 7 days via form FOR569 to hygieneunit@worksafe.vic.gov.au or PO Box 279, Geelong VIC 3220. Deadline: 20 November 2025 at the latest. — **Not done**

- **Employer → Worker (Reg 196(1))**: Pre-commencement health monitoring before 13 November 2025. — **Done 4 days late (18 November 2025)**

- **Employer → Worker (Reg 196(2))**: Follow-up biological monitoring within one month (by 13 December 2025). — **Not done by employer. Test on 18 December 2025 arranged by worker/GP for clinical reasons, 5 days overdue**

- **Employer → Worker (Reg 198(1A))**: 6-weekly monitoring once BLL ≥ 5 µg/dL. — **Not done. No employer contact after 6 January 2026. Test on 20 February 2026 arranged independently by worker/GP (9+ weeks later)**

- **Employer → Worker (Regs 190, 191, 205)**: Provide separate eating area, washing facilities, and meal breaks away from lead work. — **Apparently not done. Worker required to work 7:00–15:30 shifts with no meal break**

- **Employer → Worker (Reg 192): Arrange laundering of lead-contaminated work clothing; ensure contaminated clothing not taken home.** — **Not done. Work clothing was not taken home. Employer stated that contaminated work clothing and PPE would be laundered offsite when "dirty enough" - not at the end of every shift as required by Compliance Code.**

- **Employer → Worker (Reg 199)**: Immediately remove from lead-risk work upon 18.6 µg/dL result. — **Not done (employment ended instead)**

- **Employer → Medical practitioner (Reg 200)**: Arrange medical examination within 7 days of removal. — **Not done. No employer contact after 6 January 2026**

- **Employer → WorkSafe Victoria (Reg 203)**: Send biological monitoring results to WorkSafe after removal. — **Presumably not done. No formal removal; notification of removal presumably not sent to WorkSafe**

- **Pathology laboratory → Department of Health**: Notify of BLL > 5 µg/dL within 5 days of diagnosis (deadline: 27 December 2025). [PHWA 2008; PHWR 2009 as amended 1 September 2018] —**Done: 22 December 2025**

- **Pathology laboratory → GP (Reg 181)**: Notify supervising registered medical practitioner of result. — **Done: 22 December 2025**

- **GP → Employer (Reg 202(2))**: Provide biological monitoring report to employer. — **Worker informed employer directly on 6 January 2026**

- **Department of Health response: Any mandatory action or referral to WorkSafe upon receiving laboratory notification — see Q6 — the Department's response actions appear discretionary under PHWA Part 8 rather than mandatory; whether referral to WorkSafe Victoria occurs as a matter of practice is not stated on publicly available Department of Health guidance.**

References

Note that LID is the Library Identifier from The LEAD Group's Library Database.

AFOEM (2026) Australasian Faculty of Occupational and Environmental Medicine — Find a Consultant directory, Royal Australasian College of Physicians, https://www.racp.edu.au/about/college-structure/australasian-faculty-of-occupational-and-environmental-medicine/find-a-consultant (Accessed May 2026, as this directory updates dynamically) [LID 29398]

Austin Health Toxicology Services (2025) Clinical Toxicology Service Guideline — Lead (Pb), Poisons Information Centre, Austin Health, version 3, published August 2025, https://www.austin.org.au/Assets/Files/Lead%20Guideline_V3_8_2025.pdf [LID 29177] (Note: the worker was referred to Austin Health Toxicology Services for clinical advice. The Austin Health Toxicology Services Lead Guideline footnotes occupational removal at >20 µg/dL (0.96 µmol/L) — the pre-5-June-2020 Victorian threshold — and does not differentiate workers by gender. It is therefore inconsistent with the current Victorian OHS Regulations 2017 (which use 10 µg/dL for women of reproductive capacity and 30 µg/dL for all other workers).)

Freeman, Ronald (1970) Chronic lead poisoning in children: A review of 90 children diagnosed in Sydney, 1948-1967, The Medical Journal of Australia (MJA) March 1st 1970 https://onlinelibrary.wiley.com/doi/abs/10.5694/j.1326-5377.1970.tb116904.x [LID 3398]

health.vic.gov.au (2025) Lead and human health, Victorian Department of Health, Melbourne, 3 October 2025, https://www.health.vic.gov.au/environmental-health/lead-and-human-health [LID 29387]

Louis, ED, EC Jurewicz, LK Applegate, P Factor-Litvak, M Parides, L Andrews, V Slavkovich, JH Graziano, S Carroll and A Todd. (2003). Association Between Essential Tremor and Blood Lead Concentration, Environmental Health Perspectives, 3 July 2003 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241711/pdf/ehp0111-001707.pdf [LID 7330]

Murata K, Iwata T, Dakeishi M, Karita K. (2009) Lead toxicity: does the critical level of lead resulting in adverse effects differ between adults and children? J Occup Health, published 11 February 2009 by Japan Society for Occupational Health, https://academic.oup.com/joh/article/51/1/1/7270157 [LID 14732]

NHMRC (2016) Managing Individual Exposure to Lead in Australia — A Guide for Health Practitioners, National Health and Medical Research Council, 27 April 2016, https://www.nhmrc.gov.au/sites/default/files/documents/reports/managing-individual-exposure-lead.pdf [LID 18159]

O'Brien, Elizabeth and Roberts, Anne, with cartoon by Anne Roberts (2009) Heat and Dust: why lead poisoning is called the "Summer Disease"; Seasonal Incidence [of child EBLLs]; Do high blood lead levels cause a rise in body temperature? How does heat affect the lead poisoned individual? Saunas or heating and showering as a method of "getting the lead out"; Climate change, floods, cyclones and the potential for lead poisoning, in LEAD Action News vol 9 no 4, The LEAD Group, 21 September 2009, https://lead.org.au/lanv9n4/lanv9n4-9.html [LID 11721]

OHS Act (2004) Occupational Health and Safety Act 2004 (Vic), Version 045, Authorised Version incorporating

amendments as at 6 August 2025, https://www.legislation.vic.gov.au/in-force/acts/occupational-health-and-safety-act-2004 [LID 29424]

OHS Regs (2017) Occupational Health and Safety Regulations 2017 (Vic), Version 016 (effective 26 November 2024), Part 4.3 Lead (Regs 178–205), https://www.legislation.vic.gov.au/in-force/statutory-rules/occupational-health-and-safety-regulations-2017/016 [LID 29392]

OSHA (Occupational Safety & Health Administration) US (1993a) US OSHA 1910.1025 Occupational Health Standard for Inorganic Lead, https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1025 (Accessed 17 May 2026) [LID 29385]

OSHA (Occupational Safety & Health Administration) US (1993b) Safety and Health Regulations for Construction: Lead 1926.62, Washington DC, OSHA, http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10641 (Accessed 17 May 2026) [LID 29401]

PHWAA (2022) Public Health and Wellbeing Amendment Act 2022 (Vic) (all parts effective before or on 15 February 2023), https://www.legislation.vic.gov.au/as-made/acts/public-health-and-wellbeing-amendment-act-2022 [LID 29388]

PHWR (2019) Public Health and Wellbeing Regulations 2019 (Vic) (successor to the Public Health and Wellbeing Regulations 2009, which were amended 1 September 2018), https://www.legislation.vic.gov.au/in-force/statutory-rules/public-health-and-wellbeing-regulations-2019/028 [LID 29390]

Safe Work Australia (2020) Health monitoring guide for lead (inorganic), 20 March 2020, https://www.safeworkaustralia.gov.au/system/files/documents/2002/health_monitoring_guidance_-_lead.pdf [LID 27283]

Sanders T, Liu Y, Buchner V, Tchounwou PB. (2009) Neurotoxic effects and biomarkers of lead exposure: a review, Rev. Environ. Health, 2009;24:15-45, https://pubmed.ncbi.nlm.nih.gov/19476290/ [LID 13926]

Shih R, Hu H, Weisskopf MG, Schwartz BS. (2007) Cumulative lead dose and cognitive function in adults: a review of studies that measured both blood lead and bone lead, Environ Health Perspect 2007;115:483-492, https://pmc.ncbi.nlm.nih.gov/articles/PMC1849945/ [LID 9031]

Vella, Vance; O'Brien, Elizabeth; Idris, Elisa; Wibowo, Erik; Zhu, Hugh Xin Xi; & Choong, Emily (2020) Health Impacts of Lead Poisoning — A preliminary listing of the health effects & symptoms of lead poisoning, first published 1998, updated 24 June 2005, January 2014, April 2018, September 2020, The LEAD Group Inc, https://leadsafeworld.com/wp-content/uploads/2020/09/The-LEAD-Group-Fact-Sheet-Health-Impacts-of-Lead-Poisoning-202009.pdf [LID 20220]

WIRC Act (2013) Workplace Injury Rehabilitation and Compensation Act 2013 (Vic) (as amended 6 August 2025), https://www.legislation.vic.gov.au/in-force/acts/workplace-injury-rehabilitation-and-compensation-act-2013 [LID 29262]

WorkSafe Vic — Blood Lead Testing Schedule (2024) Blood lead testing schedule for employees doing lead risk work, April 2024, https://www.worksafe.vic.gov.au/resources/blood-lead-testing-schedule-employees-doing-lead-risk-work - part of/hyperlinked from “Everything about Lead in one place” https://www.worksafe.vic.gov.au/lead [LID 29393]

WorkSafe Vic — Compliance Code (2022) Lead: Compliance Code, Edition 1, April 2022, https://www.worksafe.vic.gov.au/resources/compliance-code-lead [LID 29391]

WorkSafe Vic — Lead hub page (2024) Lead (everything about lead in one place), last reviewed 23 April 2024, https://www.worksafe.vic.gov.au/lead [LID 29393]

WorkSafe Vic — Lead-risk work page (2023) Are you performing lead-risk work? Reviewed 4 May 2023, https://www.worksafe.vic.gov.au/are-you-performing-lead-risk-work - part of/hyperlinked from "Everything about Lead in one place" https://www.worksafe.vic.gov.au/lead [LID 29393]

WorkSafe Vic — Legal duties page (2022) Lead at work: Legal duties, reviewed 31 July 2022, https://www.worksafe.vic.gov.au/lead-work-legal-duties - part of/hyperlinked from "Everything about Lead in one place" https://www.worksafe.vic.gov.au/lead [LID 29393]

WorkSafe Vic — News 2022 (2022) Lead safety breaches prompt warning, 24 May 2022, https://www.worksafe.vic.gov.au/news/2022-05/lead-safety-breaches-prompt-warning - part of/hyperlinked from "Everything about Lead in one place" https://www.worksafe.vic.gov.au/lead [LID 29393]

WorkSafe Vic — Notification Form (2024) Notification of Lead-Risk Work (Form FOR569), August 2024. Submit to: WorkSafe Victoria, Occupational Hygiene Unit, PO Box 279, Geelong VIC 3220; https://www.worksafe.vic.gov.au/resources/lead-risk-work-notification-work [LID 29079]

WorkSafe Vic — Proclaimed diseases (2022) New silica-related diseases now proclaimed (includes the current Victorian proclaimed diseases list, including 'Lead poisoning or its sequelae'), reviewed 29 July 2022, https://www.worksafe.vic.gov.au/new-silica-related-diseases-now-proclaimed [LID 29425]

WorkSafe Vic — Safety Alert 2025 (2025) Lead-based Paint Removal (Safety Alert), 20 January 2025, https://www.worksafe.vic.gov.au/safety-alerts/lead-based-paint-removal - part of/hyperlinked from "Everything about Lead in one place" https://www.worksafe.vic.gov.au/lead [LID 29393]

UN & WHO Lead Paint Alliance Annotated Bibliography of Recent News

The LEAD Group Inc charity in Australia, asked Claude AI to write an Annotated Bibliography of the articles – many of them from the Center for Global Development (CGD) website - listed in the "In the News" section of "Eliminating lead paint matters!" 17 April 2026, by the Lead Paint Alliance or more fully, the Global Alliance to Eliminate Lead Paint. This article is the result.

LID is the Library Identifier from The LEAD Group's Library Database.

Introduction *[to United Nations and World Health Organisation Lead Paint Alliance 17 April 2026 newsletter, which was published in full as UN & WHO Lead Paint Alliance Plethora of Global Events in The LEAD Group's* LEAD Action News vol 23 no 3*, April 2026 at both www.lead.org.au and www.leadsafeworld.com]*

The Alliance is pleased to present its April 2026 newsletter in which we share updates about the ongoing work to phase out lead paint worldwide, including new lead-related resources, updates on progress towards laws, and lead paint in the news.

In the News: Lead Paint and Other Sources of Lead Exposure

These articles do not necessarily reflect the views or work of the Global Alliance to Eliminate Lead Paint.

Information and Action to Address Health Effects of Lead Exposure

The Long-Lasting Effects of Early Childhood Lead Exposure: Evidence from Piston-Engine Aircraft Emissions

Duong and Zhong. November 2024,
https://papers.thaotduong.com/Thao_Duong_Lead_Exposure.pdf [LID 29307]

United States, drawing on Texas longitudinal student data. National in scale, with global relevance for any jurisdiction where piston-engine aircraft (PEA) still use leaded fuel. Duong and Zhong exploit the sharp post-9/11 decline in PEA traffic as a natural experiment, employing difference-in-differences and instrumental variable strategies to estimate the causal effects of early childhood lead exposure on long-term outcomes. They find that a one-unit increase in PEA-emitted lead exposure from kindergarten through third grade significantly reduces educational attainment (lower test scores, lower high school graduation rates, reduced college enrolment) and adult labour market earnings, with marginal effects on school absenteeism and disciplinary incidents. The paper takes the CDC's 2021 reference value of 3.5 µg/dL as the relevant policy threshold and argues that even at the low

blood lead levels typical of post-leaded-gasoline America (down more than 90% since the 1970s), early-life lead exposure imposes substantial lifetime costs. The named source is PEA emissions, currently the largest remaining contributor to airborne lead in the US, as PEA is the only aircraft type still using leaded fuel.

2024 Volcano Art Prize
Elizabeth O'Brien: *Petition for our children:* Lead-Safety Message: Please sign my Petition EN6714 - Circular Economy for Lead to not only stop new lead mines digging more lead out of the ground but also start collecting and recycling ALL the lead already in circulation in Australia.
Description of Work: iPhone 13 photos collaged in Powerpoint. https://volcanoartprize.com/portfolio-item/petition-for-our-children/ [LID 28163]

Beyond mining: A pioneer attempt to assessing lead exposure risks in Nigeria

Fabolude et al. Environmental Impact Assessment Review. July 2025, https://www.sciencedirect.com/science/article/abs/pii/S0195925525001209?via%3Dihub [LID 29308]

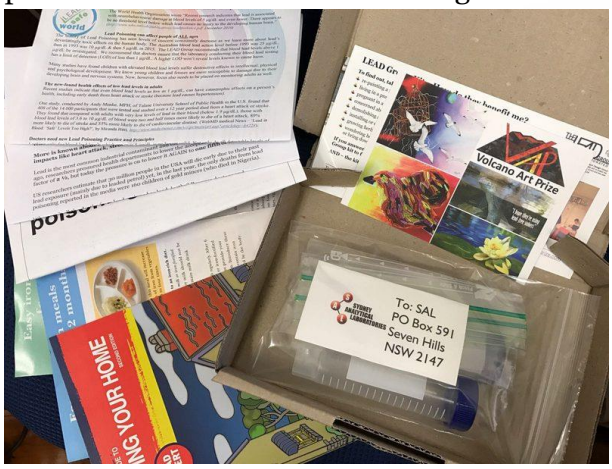
Nigeria, nationwide across all states. National in scale, with explicit methodological transfer to other LMICs facing similar data constraints. Fabolude and colleagues construct a Lead Exposure Index for Nigeria's states using Principal Component Analysis applied to road density, aerosol optical depth, poverty, and Google Trends data. The index identifies urban centres (Lagos and the Federal Capital Territory) and northern states as high-risk areas, extending the well-known artisanal-mining narrative into a broader account of exposure driven by urbanisation, road traffic, and environmental factors. Temporal Google-Trends analysis shows a spike in public interest following the 2010 Zamfara crisis, then a rapid decline, which the authors flag as a case for sustained awareness campaigns. The study does not measure blood lead levels: the authors explicitly note that the unavailability of direct BLL data is a constraint on validation, and they recommend nationwide BLL testing as a priority. Sources of exposure named: artisanal mining (historically dominant), road-traffic-related emissions, lead-based products, and environmental aerosols. The work is positioned as a screening methodology for countries where direct exposure data are sparse.

APEC calls for roadmap to eliminate lead from new water systems in Asia-Pacific Region

KTLA. July 2025, https://ktla.com/business/press-releases/ein-presswire/835952140/iapmo-supports-apec-workshop-in-south-korea-on-safe-drinking-water/ [LID 29312]

Asia-Pacific Economic Cooperation (APEC) region, with the workshop held in Incheon, South Korea (26-31 July 2025) and participation from the Philippines, Indonesia, the United States, Chile, China, Chinese Taipei, Malaysia, Thailand, Singapore, and Vietnam. Regional in scale, with implications for

global drinking-water-standards harmonisation. The article is a press release reporting on the APEC workshop "Strengthening Standards and Technical Regulations for Safer Drinking Water", supported by IAPMO, which aims to develop a collective roadmap for safer and more sustainable drinking water and sanitation systems across APEC economies. The workshop addresses material safety standards for plumbing products, prevention of contamination, supply chain integrity, and mutually recognised conformity assessment to reduce technical trade barriers. The framing statistic is that more than 2.2 billion people worldwide lack access to safely managed drinking water. No blood lead levels are reported. Lead is addressed implicitly via plumbing-material safety; explicit lead-source naming and concentration data are not included in the press release itself, though the LAN newsletter framing positions it as relevant to eliminating lead from new water systems.



2017 Volcano Art Prize
Andriam Bala: *New Brass taps often add lead to water:* Lead-Safety Message: Test your water before drinking from a brass tap or rainwater system using a LEAD Group Water Kit or Comprehensive Kit.
Description of Work: iPhone 4s video production with cinematography by Elizabeth O'Brien and editing by Malveek Kaur Dhaliwal.
https://volcanoartprize.com/portfolio-item/new-brass-taps-often-add-lead-to-water/ [LID 18507]

Evaluation of Lead Concentrations in Blood Samples from Donors in a Tertiary Hospital Located in the Niger Delta, Nigeria

Uku et al. International Journal of Research and Reports in Hematology. August 2025, https://journalijr2h.com/index.php/IJR2H/article/view/182/399 [LID 29309]

Nigeria, Port Harcourt in the Niger Delta. Regional in immediate scope, with implications for transfusion safety wherever donors live in heavily oil-polluted environments. Uku and colleagues ran a cross-sectional study of 246 male blood donors at the University of Port Harcourt Teaching Hospital blood bank, measuring blood lead by atomic absorption spectrophotometry. Mean blood lead level was 35.94 plus or minus 19.09 µg/dL (median 32 µg/dL), with 94.7% of donors above the WHO and ATSDR action threshold of 5 µg/dL and only 5.3% below it. The 18 to 25 age group, accounting for 65.4% of donors, carried the highest BLLs ($p = 0.013$). Strikingly, 96.3% of donors were non-smokers, did not work in lead-exposed occupations, and lived neither near paint factories nor refuse dumps, yet still showed grossly elevated BLLs, pointing to ambient environmental contamination as the dominant driver. All donors reported regular seafood consumption. The authors locate the cause in decades of oil-multinational and artisanal-refining pollution of Niger Delta air, soil, water, and seafood, and call for routine BLL screening of donor blood used for neonates, pregnant women, and young children. Sources of lead named: petroleum-industry environmental contamination (hydrocarbons and co-pollutants), illegal artisanal refining, polluted seafood, and ambient air.

Preventing lead (Pb) contamination in rural community water systems in LMICs

through analytical screening, policy and standards enforcement, and supply chain interventions

Roy et al. Groundwater for Sustainable Development. November 2025, https://www.sciencedirect.com/science/article/pii/S2352801X25001067 [LID 29298]

Ghana, with field work across seven rural districts (Bawku West, Builsa South, Fanteakwa, Garu, Sekyere East, West Gonja, Zabzugu) spanning three regions; global in implication for low- and middle-income country (LMIC) water supply chains. Roy and colleagues screened 101 rural water systems (84 India Mark II and Afridev borehole handpumps, 17 mechanised piped systems with taps) installed during 2019 to 2022, using a handheld X-ray fluorescence (XRF) analyser. Despite manufacturer assurances of lead-free components, 56.5% of handpump tanks (47/84) and 100% of mechanised-system taps (17/17) exceeded the NSF 372 / IPC lead-free standard of 0.25% Pb by weight; tap brasses ran up to 3.84% Pb and tanks up to 2.29%. Riser pipes, rods, cylinders, and foot valves generally complied. The team engaged original equipment manufacturers to source stainless steel substitutes; the switch lifted total system installation cost by 2% or less. No new blood lead levels are reported (the study is component-screening, not biomonitoring), but the authors frame the work against the WHO 5 µg/dL action level and prior data showing 9% of Ghanaian rural water samples above the 10 µg/L WHO Pb guideline. Sources of lead named: leaded brass and bronze fittings, galvanised steel tanks, and locally forged replacement valves within global LMIC plumbing supply chains, especially Indian-manufactured handpump components.

2024 Volcano Art Prize
Elizabeth O'Brien: *Lead Paint Recycling:* Lead-Safety Message: Strip old paint safely, recycle lead paint waste, make lead acid batteries from 100% recycled lead, toward achieving a circular economy for lead.
Description of Work: iPhone 13 photo.
https://volcanoartprize.com/portfolio-item/lead-paint-recycling/ [LID 28189]

A simple kit to detect extractable lead concentrations in soil

Moura et al. Geoderma. September 2025, https://www.sciencedirect.com/science/article/pii/S0016706125003441?via%3Dihub [LID 29310]

United States and Peru, with field validation in mining-impacted Peruvian towns. Global relevance for low-cost soil-lead screening in any community lacking access to laboratory ICP-MS or XRF. Moura, van der Molen, and van Geen describe a simplified field kit (single plastic test tube, soluble glycine hydrochloride capsule, pH paper, and a cotton swab impregnated with sodium rhodizonate) costing under USD 1 per test. Soil is extracted in simulated gastric fluid; the swab turns purple in the presence of bioaccessible lead. Tested on 201 paired samples from the US and Peru, the kit shows roughly 85% sensitivity and specificity at a threshold of approximately 200 mg/kg extractable Pb, with a method limit of detection near 600 mg/kg. The kit was deployed by nearly 2,000 high school students who collected and tested about 1,500 soil samples across three Peruvian mining towns. No blood lead

levels are measured: the focus is on the proximate exposure pathway. Source of lead addressed: contaminated soil, particularly from mining and historic paint, screened at household and community scale.

2025 Volcano Art Prize
Anna Mutton: *Still Waters Heavy Metals:* Lead-Safety Message: Lead contamination continues affecting drinking water supplies and environments; an aurora arcing gently over a quiet mountain range and undisturbed lake reflects how ecosystems react to pollutants we cannot perceive. **Description of Work:** Watercolour and acrylic paint on watercolour paper. https://volcanoartprize.com/portfolio-item/still-waters-heavy-metals/ [LID 28707]

NESREA seals 29 facilities in S'West for environmental pollution

PUNCH. September 2025, https://punchng.com/nesrea-seals-29-facilities-in-swest-for-environmental-pollution/ [LID 29311]

Nigeria, with enforcement actions in Ogun, Ekiti, and Osun states (south-west). National in scale, with implications for ULAB (used lead-acid battery) recycling enforcement across West Africa. PUNCH reports that the National Environmental Standards and Regulations Enforcement Agency (NESREA) sealed 29 facilities, nine of them battery and scrap-metal recyclers in the Ogijo community of Ogun State. NESREA Director General Innocent Barikor cites improper disposal of hazardous slag from battery recycling and notes that "tests have revealed the presence of lead in residents, resulting in illnesses and deaths"; no specific blood lead level values are reported in the article. Cited offences include failure to conduct staff blood-lead tests, lack of fume-treatment plants, indiscriminate black-oil discharge, manual battery breaking and washing, and non-compliance with Extended Producer Responsibility under the National Environmental (Battery Control) Regulations 2024. Sources of lead named: informal ULAB recycling, battery slag, and uncontrolled smelter emissions. The remaining 20 closures spanned construction, quarrying, plastics, food processing, and stone milling.

Buffalo forfeits more than $1 million in federal lead funds

Investigative Post. September 2025, https://investigativepost.org/2025/09/11/buffalo-forfeits-more-than-1-million-in-federal-lead-funds/ [LID 29313]

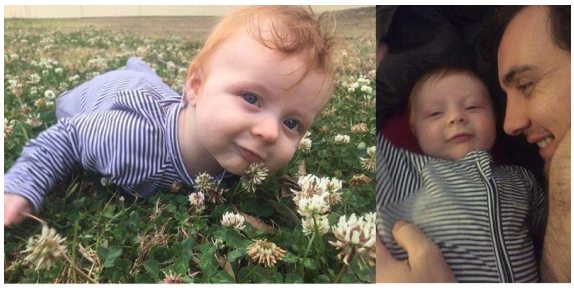
United States, Buffalo, New York. Local in scale, with broader implications for US municipal stewardship of federal lead-remediation grants. Investigative Post reports that the Buffalo Urban Renewal Agency (BURA) is forfeiting roughly USD 1.2 million of a USD 2 million 2021 HUD Lead Hazard Reduction Program grant, having spent or earmarked only USD 796,050. Of 110 homes originally targeted for lead-hazard remediation, work has been completed or contracted on just 34 units. HUD denied a second extension request. The article quotes advocates and elected officials describing the underspend as a "major failure" and "incompetence", and cites Buffalo's 14212 ZIP code as having the highest confirmed-child-lead-poisoning rate in New York State, with a quarter of children tested in 2020 showing elevated blood lead levels (specific BLL concentrations not stated;

"elevated" follows the NYS Department of Health reporting threshold). Source of lead: deteriorated lead-based paint in older rental housing stock. The story closes with state-level enforcement (a USD 515,000 settlement against a San Diego landlord over 14 children exposed in Buffalo properties).

Chicago has the most lead pipes in the nation. We mapped them all

Grist. September 2025, https://grist.org/accountability/chicago-lead-pipe-replacement-map-health/ [LID 29314]

United States, Chicago, Illinois. Local in scale, with national implications under the US EPA's Lead and Copper Rule Improvements (LCRI) and federal lead service line replacement deadlines. A Grist / Inside Climate News / WBEZ partnership analyses city Department of Water Management inventory data obtained by public records request and publishes an interactive address-level map of lead, suspected-lead, galvanized-requiring-replacement, and non-lead service lines. Chicago holds the nation's largest stock, with an estimated 412,000 of roughly 491,000 service lines containing or suspected of containing lead; the city's current replacement schedule will not finish until 2076, three decades past the federal deadline. The burden is racially patterned: 92 percent of service lines need replacement in majority-Latino census tracts, 89 percent in majority-Black tracts, 74 percent in majority-white tracts, and 65 percent in majority-Asian tracts. No blood lead level measurements are reported; the article frames cumulative exposure risk alongside industrial air pollution. Source of lead: lead and galvanised water service lines, gooseneck connectors, and internal plumbing in pre-1986 housing.



2019 Volcano Art Prize
Justine Cooney: *Good grass cover protects a baby from leaded soil:* Lead-Safety Message: Good grass cover or mulch or paving stops access to leaded soil but when a baby starts to crawl, parents have to stay very close to stop contaminated soil going in the mouth. **Description of Work:** Smartphone photos collaged using Word and Paint. https://volcanoartprize.com/portfolio-item/good-grass-cover-protects-a-baby-from-leaded-soil/ [LID 20246]

Toward a Lead-Free Future: Mobilizing to End Childhood Lead Exposure

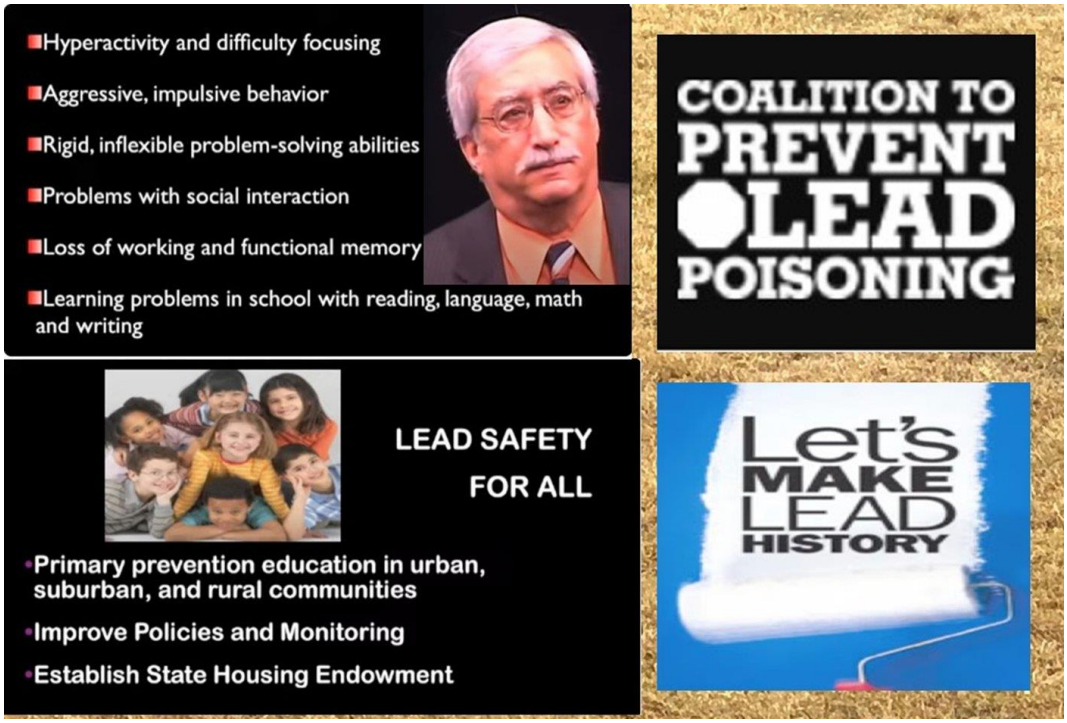
Partnership for a Lead-Free Future (PLF). September 2025, https://www.leadfreefuture.org/events-and-resources/events/toward-lead-free-future-mobilizing-end-childhood-lead-exposure [LID 29315]

Global, with country leadership drawn from Bhutan, Bangladesh, Guinea, Ethiopia, and Vietnam. Global in scale, with operational implications for LMIC ministries of health and the UN system. The Partnership for a Lead-Free Future (PLF) convened a high-level breakfast during the 2025 UN General Assembly to accelerate action and investment toward ending childhood lead exposure. The page anchors the now-standard PLF framing statistic: lead poisoning affects 1 in 3 children worldwide, undermining health, education, and economic potential, with the heaviest burden in low- and middle-income countries. The central question posed is what it will take, technically, politically, and financially, to deliver a lead-free future. No blood lead level figures are reported in the event description itself; the "1 in 3" figure corresponds to the IHME / UNICEF threshold of 5 µg/dL. Sources of lead are not enumerated on the event page. Speakers included PM Tshering Tobgay (Bhutan), UN DSG Amina Mohammed (video), UNICEF Executive Director Catherine Russell, UNEP Executive Director Inger Andersen, and health ministers from Bangladesh, Guinea, Ethiopia, and Vietnam, plus Open Philanthropy's Lead Exposure Action Fund and Bloomberg Philanthropies.

Mobilizing to End Childhood Lead Poisoning: Year 1 Progress Update

Partnership for a Lead-Free Future. September 2025, https://www.leadfreefuture.org/events-and-resources/knowledge-library/mobilizing-end-childhood-lead-poisoning-year-1-progress [LID 29316]

Global, with the PLF Secretariat housed at UNICEF in New York. Global in scale, with direct implications for the UN system, LMIC ministries of health, and philanthropic donors funding lead-poisoning programmes. The Partnership for a Lead-Free Future (PLF) reports on its first twelve months of coordinated action to end childhood lead poisoning. Stated achievements include increased government focus, expansion of the evidence base through national blood lead surveys and environmental assessments, and growth of the membership to include additional governments, multilateral organisations, civil society groups, and philanthropic actors (notably Open Philanthropy and Bloomberg Philanthropies). The headline figure shared at UNGA80 estimates that USD 1.6 billion invested over 15 years could eliminate lead poisoning as a significant health issue in LMICs. No new blood lead level data are reported in the progress update itself, which frames its case against the standing PLF / UNICEF "1 in 3 children" estimate (BLL above 5 µg/dL). Sources of lead are not enumerated in this top-line summary; the progress update functions as an annual report rather than primary research.



2025 Volcano Art Prize

Ralph Spezio, School Principal: *Put Children First:* Lead-Safety Message: When we have slain the lead monster, we will truly know we have put children first. **Description of Work:** TEDxRochester video presentation from 1 November 2010, created using PowerPoint and Paint; combines screenshots illustrating learning and behavioural problems caused by lead exposure alongside three actionable solutions. https://volcanoartprize.com/portfolio-item/put-children-first/ [LID 28914]

Toward a Lead-Free Future: The Fase for Action Now

Devex. September 2025,

https://www.youtube.com/watch?app=desktop&v=cPRVaIQnkYc&utm_source=lead [LID 29317]

Global, side event co-hosted in New York during the 80th United Nations General Assembly. Global in scale, with framing aimed at development financiers and policy ministries in low- and middle-income countries. The Devex YouTube recording (full video not transcribable through web fetch) accompanies a sponsored Devex article ("Toward a lead-free future: the case for action now", October 2025) drawn from a side event organised by Devex and Open Philanthropy alongside the Partnership for a Lead-Free Future. The framing argument is that childhood lead poisoning affects roughly 800 million children annually yet receives disproportionately little global attention and funding, and that tackling it is technically and fiscally tractable. The discussion calls for layered national models in which governments set rules, formal industries lift standards, and community organisations ground delivery, and flags low-cost sensors and smartphone-based screening as scalable testing platforms. No new blood lead level values are reported; the "800 million" framing follows the standard UNICEF / IHME estimate at the 5 µg/dL threshold. Sources of lead are not enumerated in this strategic-framing piece.

Improving the Lead Impact Model Biokinetic modeling for lead exposure attribution

Rethink Priorities. September 2025, https://rethinkpriorities.org/wp-content/uploads/2025/09/Improving-the-Lead-Impact-Model.pdf [LID 29318]

Global, with empirical anchoring in Pure Earth's Rapid Market Screening (RMS) sampling across 25 LMICs. Global in scale, with implications for how the burden of lead poisoning is apportioned across exposure sources in donor priority-setting. Rethink Priorities, working with Open Philanthropy and Pure Earth, presents an exploratory revision of Pure Earth's Lead Impact Model (LIM). The revised module estimates population-level blood lead burdens from individual sources using a modified version of the US EPA Adult Lead Methodology (ALM), with three modifications: a leaching-rate parameter for indirect sources (paint to dust, cookware to food), separate child (0 to 6 years) and adult (7+) compartments aligned with the IEUBK model, and age-specific gut absorption fractions. The output metric is cumulative population BLL (mean BLL multiplied by exposed population). No new measured BLL values are reported; the inputs are 5,000 RMS consumer-product samples and home-based assessments. The authors are emphatic that outputs are not yet fit for resource-allocation decisions. Sources of lead modelled: lead-adulterated food and spices (best suited), cookware leaching, paint-to-dust shedding, toys, soil, dust, water, and air. Indirect and environmental pathways remain the largest uncertainty.

Using Lead Isotopes as Tracers of Ocean Pollution

Olivelli. Nature Reviews Earth & Environment. September 2025, https://www.nature.com/articles/s43017-025-00728-0 [LID 29319]

Global oceans, with named observations spanning the Atlantic, Pacific, and Canadian Arctic. Global in scale, with implications for post-leaded-gasoline pollution surveillance and the GEOTRACES marine geochemistry programme. In a Nature Reviews Earth & Environment "Tools of the Trade" piece, Olivelli (Imperial College London, now Flanders Marine Institute) explains how lead isotope ratios (rather than bulk concentrations) are used to attribute oceanic lead pollution to specific sources, since industrial lead from coal combustion, smelting, incineration, and leaded gasoline carries distinct isotopic fingerprints relative to natural background. The 2021 global ban on leaded petrol is documented as having reduced concentrations in the Atlantic and Pacific, yet anthropogenic lead has still reached the deep ocean, including remote Arctic waters, and sometimes appears in isotope ratios without an accompanying concentration rise. No blood lead level values are reported; the medium is seawater, not human tissue. Sources of lead named: coal combustion, metal smelting, waste

incineration, and the legacy plume from leaded gasoline. The article is positioned as a methodological brief for monitoring emerging and unrecognised pollution pathways.

Environmental Lead Risk in the 21st Century

Chen et al. Communications Earth & Environment. September 2025, https://www.nature.com/articles/s43247-025-02735-x?utm_source=lead-update.cgdev.org [LID 29320]

Global, with explicit disaggregation by high-income versus low- and middle-income countries. Global in scale, with implications for the next decade of lead policy as the electrification-driven lead-acid battery industry expands. Chen and colleagues, in this open-access Communications Earth & Environment review, argue that the apparent victory over environmental lead is partial: in many LMICs the initial post-leaded-petrol decline in mean blood lead levels has flattened or reversed, with mean BLLs remaining above the WHO intervention level. They estimate annual global economic loss from contemporary childhood lead exposure exceeding USD 3.4 trillion (2021 USD, PPP-adjusted), with the burden falling overwhelmingly on LMICs. Current annual lead production is around 16 million tonnes, dwarfing the total nine million tonnes emitted from leaded petrol historically. Sources of lead emphasised: legacy contamination, ongoing coal combustion, lead-acid battery manufacture and informal recycling, and lead-containing consumer goods. Specific population-level BLL values are not pulled into the abstract; the paper benchmarks against the WHO BLL reference value of 5 µg/dL. The authors identify four areas requiring urgent policy intervention to prevent a resurgence.

2021 Volcano Art Prize
Consolata Frigil Kimario and Nancy Mwangi Njeri (performers); Dr Faridah Hussein Were (poet): *Working together to eliminate lead paints from the universe:* Lead-Safety Message: Effects of lead on children, such as low IQ, men and women as well as the environment. Encouraging stakeholders to work together to eliminate lead paints from the universe. **Description of Work:** A poem by Dr Faridah Were performed by two of her students on the 9th International Lead Poisoning Prevention Week of Action, 24-30 October 2021. https://volcanoartprize.com/portfolio-item/working-together-to-eliminate-lead-

paints-from-the-universe/ [LID 25806]

FG Inaugurates National Working Group to Eliminate Lead Poisoning in Nigeria

Arise News. September 2025, https://www.arise.tv/fg-inaugurates-national-working-group-to-eliminate-lead-poisoning-in-nigeria/ [LID 29321]

Nigeria, with the workshop convened in Abuja and recent outbreaks cited in Zamfara, Niger, and Sokoto states. National in scale, with regional implications for West African lead-poisoning governance. Arise News reports the Federal Ministry of Health and Social Welfare's inauguration of the National Interagency Working Group on Lead Poisoning Elimination and a two-day workshop to finalise and validate the Five-Year National Strategic Plan on Lead Poisoning Elimination. Coordinating Minister Muhammad Ali Pate (represented by Permanent Secretary Daju Kachollom) framed lead poisoning as a public health crisis affecting children's neurodevelopment and adults' cardiovascular, renal, and reproductive systems. The article cites the 2010 Zamfara outbreak (over 400 child deaths from artisanal-mining-related exposure), the 2015 Niger State outbreak, and fresh 2024 cases in Zamfara and Sokoto. No quantitative blood lead level values are provided. Sources of lead named: artisanal gold mining and associated ore processing, with implied secondary contamination of soil, crops, homes, workplaces, and water. The group's mandate spans exposure assessment, policy review, workforce capacity, and sustainable financing, coordinating across the Ministries of Environment, Solid Minerals, Steel, Agriculture, and Water Resources, NESREA, NAFDAC, SON, UNICEF, WHO, Resolve to Save Lives, and MSF (chelation therapy delivery partner).

Assessment of lead levels in decorative paints and potential health risks in Malawi

Mologo et al. Discover Environment. September 2025, https://link.springer.com/article/10.1007/s44274-025-00365-w?utm_source=lead-update.cgdev.org [LID 29322]

Malawi, with sampling in Blantyre, Lilongwe, and Mzuzu (covering the Southern, Central, and Northern regions). National in scale, with implications for African Lead Paint Elimination Project (GAELP) implementation and Malawi's regulatory limit of 90 mg/kg (90 ppm). Mologo and colleagues analysed 66 paint samples (high-gloss enamel, emulsion, undercoat, and primer) from 8 local manufacturers and 3 importers, plus paint flake samples from old primary school buildings, by flame atomic absorption spectrometry (ISO 6503:1984). Locally manufactured gloss enamel yellow paints recorded lead concentrations far exceeding the 90 mg/kg Malawi Standard, with values reported up to 20,740 mg/L; imported paints were substantially lower. A child human-health-risk assessment (EPA Exposure Factors Handbook ingestion model, body weight 31.9 kg, 100 mg/day ingestion, 180 days/year, 6-year exposure) was used to derive hazard quotients and incremental lifetime cancer risk for paint-flake ingestion in school environments. The study does not measure blood lead levels in Malawian children but cites earlier reports of high BLLs and the WHO reference value of 5 µg/dL. Sources of lead identified: solvent-based decorative paints (especially yellow, red, green colorants) and deteriorating school-building paint dust.

2020 Volcano Art Prize
Michael Musenga: ***Working to eliminate lead paint in Zambia:*** **Lead-Safety Message:** Lead Safe Zambia by 2020. **Description of Work:** Documents a 2016-2017 lead paint study in Zambia by the Children's Environmental Health Foundation (CEHF) that prompted government regulations banning paints exceeding 90 ppm lead content. https://volcanoartprize.com/portfolio-item/working-to-eliminate-lead-paint-in-zambia/ [LID 19830]

Lead batteries are poisoning millions of children. Here are 3 proven ways to stop it

Pawar. Vox. September 2025, https://www.vox.com/future-perfect/462703/lead-batteries-poisoning-solutions-brazil-epr-policy [LID 29323]

Global, with detailed case studies of Brazil, China, South Africa, the Philippines, India, Nigeria, Mexico, and the United States (Flint, Michigan reference point). Global in scale, with explicit policy-transfer claims for low- and middle-income countries. Pawar, writing in Vox Future Perfect, names informal used lead-acid battery (ULAB) recycling as one of the leading and most neglected global sources of childhood lead exposure: a typical car battery contains 15 to 20 pounds of lead worth about USD 15 at world prices, and roughly 10,000 to 30,000 informal smelters operate worldwide. The article cites the standard "1 in 3 children, 800 million globally" figure with blood lead levels at or above the Flint, Michigan crisis benchmark (no specific µg/dL value is given in the excerpt, though this maps to the WHO 5 µg/dL reference). The piece outlines three proven interventions: Brazil's removal of value-added tax on used-battery sales to licensed recyclers (which lifted formal recycling above 75% by 2022), China's enforced shutdown of illegal smelters paired with formal-sector incentives, and South Africa's extended-producer-responsibility take-back mandate. The World Bank 2023 estimate of USD 6 trillion annual GDP loss (about 7%) is cited. Sources of lead: informal ULAB recycling (acid drained on ground, lead plates melted in makeshift furnaces, slag dumped in fields and streams), plus poorly run formal plants in Nigeria and Mexico.

Elevated blood lead levels and associated risk factors among school children in a non-industrialized city in Indonesia

Nurjannah et al. PLOS One. October 2025, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0332301 [LID 29324]

Indonesia, Banda Aceh (Aceh Province, northern Sumatra), a non-industrialised city. National in scale, with implications for under-studied Indonesian populations outside known ULAB and smelter hotspots. Nurjannah and colleagues enrolled 130 randomly selected schoolchildren between October and December 2022 and measured venous blood lead alongside structured questionnaires on family demographics and household environment. Mean BLL was 3.01 plus or minus 1.14 µg/dL; 32 of 130 children (24.6%) had elevated BLLs at the CDC reference value of 3.5 µg/dL or higher. Multivariate analysis identified three independent risk factors for elevated BLL: male sex (OR 4.47, 95% CI 1.44 to 13.85, p = 0.009), mother's lower educational attainment (OR 3.85, 95% CI 1.35 to 10.95, p = 0.011), and corrugated iron roof on the home (OR 8.77, 95% CI 1.03 to 74.81, p = 0.047). Age, welfare status, water source, paternal smoking, and urban versus rural residence were not significant. The corrugated iron roof finding implicates rainwater-runoff and dust pathways. Sources of lead discussed in framing: ULAB recycling, leaded paint, cigarettes, foodstuffs, cookware, water pipes, furniture, house roofs, and traditional cosmetics. The authors call for larger samples and a national monitoring system, noting Indonesia has none.

2021 Volcano Art Prize
Shristi Lohani: *Beware of the lead paint in kids toys:* Lead-Safety Message: Let's be careful we are not handing lead painted toys to our kids. **Description of Work:** Digital photo. https://volcanoartprize.com/portfolio-item/beware-of-the-lead-paint-in-kids-toys/ [LID 27721]

The Impact of Lead Water Pollution on Birth Outcomes: A Natural Experiment in Scotland

Higney et al. Environmental and Resource Economics. October 2025, https://link.springer.com/article/10.1007/s10640-025-01041-6 [LID 29325]

Scotland, Edinburgh and Glasgow plus surrounding areas. National in scale for the UK; methodologically important globally for any jurisdiction undertaking lead pipe replacement. Higney and colleagues exploit two natural experiments in Scotland (water-pH treatments in the 1970s and a second round in the 1980s to 1990s) introduced to suppress the dissolution of lead from plumbing into Edinburgh's and Glasgow's soft, acidic upland-catchment water supplies. The historical exposure context is striking: in 1975, 33% of Scottish households had water lead above 50 µg/L, and 50% of surveyed Glasgow households exceeded 100 µg/L, levels comparable to the worst contemporary global readings (Ericson et al. 2021). Using a staggered difference-in-differences design on roughly 650,000 birth and mortality records linked to maternal address (1975 to 2000), the authors find no consistent effect of the water-treatment-induced lead reduction on birthweight or under-5 mortality, though the minimum detectable effect cannot rule out 1 to 3 deaths prevented per 1,000 births. Blood lead level

values for the cohort are not reported in this paper; the prior Glasgow and Edinburgh lead studies are cited. Source of lead: lead pipes and fittings releasing lead into soft, acidic drinking water (plumbosolvency). The result diverges from North American studies finding birthweight and mortality effects, prompting calls to investigate mediating pathways.

Candidate biomarkers of lead-exposed municipal water biofilms provide insights into lead monitoring potential

Mirza et al. Journal of Applied Microbiology. October 2025, https://academic.oup.com/jambio/article-abstract/136/10/lxaf247/8275757 [LID 29326]

United States, laboratory pipe-loop experiments by a multi-institution team (Memphis, Clemson). Global in scale, with implications for drinking-water lead monitoring in any distribution system using plastic service lines. Mirza, Hadiuzzaman, Ladner, Salehi, and Brown developed biofilms inside cross-linked polyethylene (PEX-A) and high-density polyethylene (HDPE) pipe loops, exposed them to lead at 0, 5, and 500 µg/L for 4 and 8 weeks, then ran a 4-week recovery phase in lead-free water. Using 16S rRNA bacterial metabarcoding and biomarker analyses, they show that lead exposure measurably shifts biofilm microbial community structure and identify a set of indicator taxa whose abundance signatures persist after lead is removed. The take-home: candidate biofilm biomarkers offer a complementary, possibly more sensitive, route to detecting historical and intermittent lead contamination than spot water sampling, which can miss episodic releases. No blood lead level data are reported (the study is microbiological). Source of lead in the experimental design: simulated plumbing release from premise-plumbing pipe materials into drinking water, the same pathway dominating contemporary US drinking-water lead exposure.

Impact of Occupational Lead Exposure on Lung Cancer Risk in Korean Male Workers: A Retrospective Cohort Study

Lee et al. Cancer Research and Treatment. October 2025, https://e-crt.org/journal/view.php?doi=10.4143/crt.2025.282 [LID 29327]

Republic of Korea, nationwide. National in scale, with implications for IARC reclassification of inorganic lead carcinogenicity (currently Group 2A in humans) and for occupational safety regulators in any industrialised economy with similar surveillance. Lee, Lee, Yoon, and Ye conducted a retrospective cohort study of 26,092 male workers identified from the Korean nationwide Special Health Examination Data with measured 2009 blood lead concentrations, linking to the national cancer registry across 1999 to 2020 with a five-year wash-out period and a mean follow-up of 9.98 years. Compared with workers having blood lead below 3.130 µg/dL, adjusted standardised incidence ratios for lung cancer were 2.95 (95% CI 1.47 to 5.27) for blood lead 3.130 to 4.899 µg/dL and 3.13 (95% CI 1.82 to 5.00) for blood lead at or above 4.900 µg/dL, after adjustment for age, smoking, exposure duration, and co-exposures to other lung carcinogens. The dose-response trend is statistically significant. The finding sits well below the conventional occupational action threshold (10 µg/dL in many jurisdictions; 5 µg/dL under recent NIOSH revision), arguing for tightened standards. Source of lead: occupational exposure across Korean industries; sectoral breakdown is not given in the abstract.

B-274 Leveraging Dried Blood Spots (DBS) for Universal Lead Screening in Children Free

Olaniyan et al. Clinical Chemistry. October 2025, https://academic.oup.com/clinchem/article/71/Supplement_1/hvaf086.661/8270208 [LID 29328]

United States, conference abstract from the AACC / ADLM annual meeting. National in scale, with global relevance for any country implementing universal childhood lead screening but lacking phlebotomy capacity. Olaniyan, Kocemba, and Dahal address the recurring screening-compliance bottleneck: in 2016, nearly 600,000 US children aged 1 to 5 years had whole blood lead at or above the CDC reference value of 3.5 µg/dL, and several states have moved to universal screening for this age group, yet attendance for venipuncture remains the rate-limiting step. The team developed and validated an Inductively Coupled Plasma Tandem Mass Spectrometry (ICP-MS/MS) method for quantifying lead in dried blood spot (DBS) samples, framed as an at-home collection workflow to lift compliance with universal screening. Specific limit of detection, linear range, and venous-versus-DBS correlation values from the validation are not retrievable from the abstract via web fetch (the meeting-supplement landing page is Cloudflare-protected). Sources of lead are not enumerated; the work is methodological. The implicit policy framing reinforces that no blood lead level in children is considered safe and that the relevant action threshold is 3.5 µg/dL under the 2021 CDC reference value.

Protein Powders and Shakes Contain High Levels of Lead

Consumer Reports. October 2025, https://www.consumerreports.org/lead/protein-powders-and-shakes-contain-high-levels-of-lead-a4206364640/ [LID 29329]

United States, with implications for any Western dietary-supplement market lacking heavy-metal limits. National in scale (US), with cross-border relevance because many tested products are exported. Consumer Reports tested 23 dairy-, beef-, and plant-based protein powders and ready-to-drink shakes, sampled across multiple lots from major US retailers, for total protein, arsenic, cadmium, and lead. More than two-thirds of products exceeded CR's daily safety level for lead in a single serving, with some exceeding it by more than tenfold. CR's daily level of concern is 0.5 µg of lead per day; two plant-based products delivered 1,200 to 1,600% of this level per serving (between 6 and 8 µg of lead per serving), and CR's chemist Tunde Akinleye flags that average lead per serving has risen since the 2010 round of testing. Plant-based products averaged nine times the lead of dairy-based products and twice that of beef-based. No blood lead level measurements are reported; the dose model is cumulative dietary exposure with no safe lead threshold acknowledged. Sources of lead named: bioaccumulation in plant protein sources (notably rice, pea, hemp, soy) grown on lead-contaminated soils; the article also names the absence of FDA limits for heavy metals in supplements as a structural driver.

2021 Volcano Art Prize
Monika Mangal: *Switch your Lead Contained Lipstick to Lead free:* Lead-Safety Message: Lead and other trace metals may be found in many lipsticks; these occur naturally and can accidentally contaminate other ingredients during production. **Description of Work:** Photograph captured using an iPhoneX device. https://volcanoartprize.com/portfolio-item/switch-your-lead-contained-lipstick-to-lead-free/ [LID 27748]

Knowledge on lead exposure among Paint workers in Kirtipur Municipality, Nepal

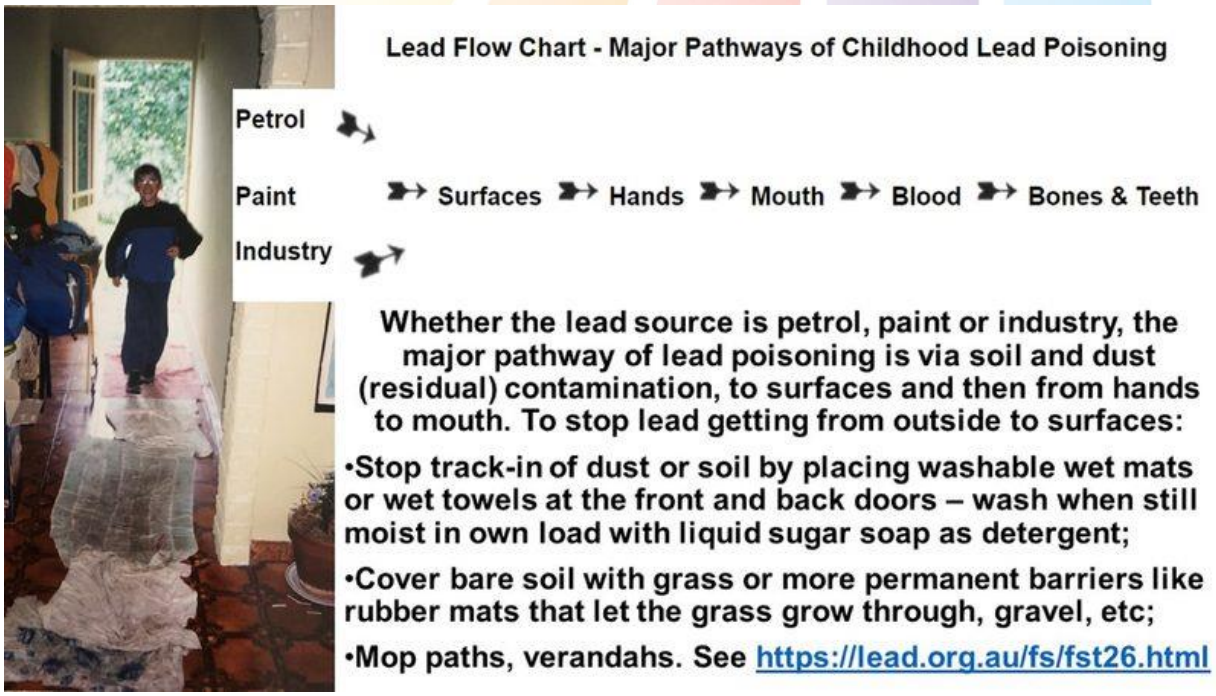
Paudel et al. International Journal of Occupational Safety and Health. October 2025, https://www.nepjol.info/index.php/IJOSH/article/view/70468 [LID 29330]

Nepal, Kirtipur Municipality (Kathmandu Valley). Local in scale, with implications for occupational health programmes across South Asian construction and decorative paint trades. Paudel and colleagues from the Nepalese Army Institute of Health Sciences and Patan Academy of Health Sciences conducted a cross-sectional study of 108 paint workers (each with at least two years of exposure) between June and August 2024, using semi-structured interviews and venous haemoglobin estimation. Mean participant age was 37.6 plus or minus 9.8 years, mean years of paint-work exposure 15.3 plus or minus 8.9 years, and mean shift length 9.4 plus or minus 2.1 hours per day. Only 10 of 108 workers (9.3%) had good knowledge of lead exposure; headache was the commonest reported symptom of lead toxicity. Formal training on hazards and safety was strongly associated with better knowledge (p less than or equal to 0.001), whereas age, work duration, experience, and education were not. On haemoglobin testing, 28 of 108 workers (25.9%) were anaemic. Blood lead levels were not measured: anaemia is used as a proxy. Sources of lead implied: occupational inhalation and dermal exposure during decorative-paint mixing, spraying, and sanding in residential and commercial settings, with no indication of consistent personal protective equipment use.

The strange role of lead poisoning in humanity's success

The Economist. October 2025, https://www.economist.com/science-and-technology/2025/10/15/the-strange-role-of-lead-poisoning-in-humanitys-success [LID 29331]

Global, with fossil specimens drawn from Africa, Asia, and Europe and contemporary laboratory work led from Southern Cross University, Mount Sinai, and UC San Diego. Global in scale, with deep-time implications for how humans evolved tolerance to a neurotoxic metal that is now re-emerging as a public health threat. The Economist summarises a Science Advances study (October 2025) that analysed dental enamel and dentine from 51 hominids, spanning modern humans, Neanderthals, Australopithecus africanus, and the extinct great ape Gigantopithecus blacki, using high-precision laser-ablation geochemistry. Distinct childhood-formed "lead bands" indicate repeated episodes of lead intake from natural sources (volcanic activity, lead-rich water and soil) and from mobilisation of skeletal lead during illness or stress, established as a recurring feature of hominid life for millions of years. Genetic and organoid follow-up suggests modern humans carry adaptations conferring greater resilience to lead's neurodevelopmental effects than archaic relatives. No blood lead levels are reported (enamel and dentine lead, not BLL, are the medium); the framing is paleoenvironmental rather than clinical. Sources of lead named: natural geochemical exposure, volcanic eruptions, and bone-stored lead released under physiological stress. The pointed framing: industrial lead lands on a species already biologically familiar with the metal.



2022 Volcano Art Prize
Elizabeth O'Brien: ***Wet towels collecting leaded soil off Harry's shoes:*** **Lead-Safety Message:** Stop leaded soil track-in with wet washable towels at the back door. **Description of Work:** Photography combined with online materials from the LEAD Group, assembled using PowerPoint.
https://volcanoartprize.com/portfolio-item/wet-towels-collecting-leaded-soil-off-harrys-shoes/ [LID 26565]

Prenatal and Early Postnatal Lead Exposure, Sensitive Periods, and Later Adult Mental Health

Lin et al. JAMA Psychiatry. October 2025, https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2840553 [LID 29332]

United States, St. Louis, Missouri. National in scale (US), with global implications for life-course evidence on prenatal lead and psychiatric outcomes. Lin and colleagues used the Saint Louis Baby Tooth Later Life Health Study (SLBT), a cohort whose deciduous (baby) teeth were banked in childhood during the 1950s to 1970s and which has been reassembled in adulthood to assess long-term outcomes. Of 5,131 SLBT participants, 718 (13.3%) had baby teeth analysed for lead with 695 and 697 contributing to the depression and anxiety endpoints respectively. Lead was quantified across tooth layers corresponding to gestational and early postnatal periods (a sensitive-period design). An interquartile-range increase in combined tooth lead was associated with nearly twofold odds of major depressive disorder in later adulthood, with the late prenatal (approximately third trimester) window emerging as the most sensitive period. Late prenatal and postnatal lead were associated with greater adult anxiety symptoms but not with categorical generalised anxiety disorder. Tooth lead, not blood lead, is the medium; no µg/dL BLL values are reported. Source of lead: ambient mid-twentieth-century US exposure dominated by leaded gasoline and lead paint.

Togo steps up fight against lead in consumer products

Togo First. October 2025, https://www.togofirst.com/en/health/2910-17430-togo-steps-up-fight-against-lead-in-consumer-products [LID 29333]

Togo, with workshop convened in Lomé on 27 October 2025. National in scale, with explicit regional

alignment to the Economic Community of West African States (ECOWAS) and the Global Alliance to Eliminate Lead Paint. Togo First reports that the Ministry of Environment, supported by the international NGO Lead Exposure Elimination Project (LEAP), brought together paint manufacturers, importers, artisans, and industry stakeholders to coordinate the phase-out of lead from paints, varnishes, cosmetics, and other consumer products. Mery Yaou (Director of Environment) framed the workshop as awareness-raising and safer-practice promotion. LEAP representative Nafissatou Cissé positioned the meeting around enforcement of the ECOWAS regulation setting a 90 parts-per-million (90 mg/kg) lead concentration limit in paints, consistent with WHO recommendations, and noted that all ECOWAS member states must adopt and enforce this standard. No blood lead level measurements are reported. Sources of lead named: industrial and decorative paints, varnishes, cosmetics, and other everyday consumer products. Secretary-General Koffi Aoufoh Dimizou reaffirmed government commitment to strengthening the environmental regulatory framework.

Life in the World's Most Polluted Town

Action for Southern Africa. October 2025, https://actsa.org/wp-content/uploads/2025/10/REPORT_-LIFE-IN-THE-WORLDS-MOST-POLLUTED-TOWN-Online-version-1.pdf [LID 29334]

Zambia, Kabwe (former lead and zinc mining town in Central Province). National in scale, with global implications for historic-pollution corporate accountability and the wider Anglo American class action heard by South Africa's Supreme Court of Appeal in November 2025. Action for Southern Africa (ACTSA), Environment Africa Zambia, London Mining Network, and Rights and Accountability in Development (RAID) document Kabwe's status as among the most lead-polluted towns on earth, with soil lead in residential areas exceeding 3,000 mg/kg (compared with the US EPA 400 mg/kg residential screening level). The report cites that 95% of local children have blood lead levels above the threshold considered to cause brain damage; specific µg/dL distributions are summarised at the report-launch level (the figure corresponds to BLL above 5 µg/dL using the historical 10 µg/dL baseline from earlier Kabwe surveys, with many children far higher). Health outcomes detailed include miscarriage, stillbirth, prenatal harm, impaired neurodevelopment, lower IQ, and behavioural and cognitive disorders. Over 100,000 to 140,000 people are framed as affected. Sources of lead: legacy soil and dust contamination from nearly a century of Broken Hill (later ZCCM, formerly Anglo American interest) lead and zinc mining and smelting, including tailings and uncovered slag heaps still present in the town.

2017 Volcano Art Prize
Isla MacGregor: *Peeling lead paint polluting patios and potato patches:*
Lead-Safety Message: Use a LEAD Group Kit to test for lead in peeling paint, dust, water and soil before you plant your potatoes or let your children play on the patio. **Description of Work:** Photograph. https://volcanoartprize.com/portfolio-item/peeling-lead-paint-polluting-patios-and-potato-patches/ [LID 18390]

Untold: Toxic Legacy

Laura Hughes. Financial Times. October 2025, https://www.ft.com/untold?utm_source=lead-update.cgdev.org&utm_medium=newsletter&utm_campaign=cgd-lead-poisoning-bi-weekly-update-october-31 [LID 29335]

United Kingdom, with named case material from Leeds and reporting across England. National in scale, with regulatory implications for the Department of Health and Social Care, Defra, and the UK Health Security Agency's Lead Exposure in Children Surveillance System (LEICSS). The Financial Times "Untold: Toxic Legacy" podcast and accompanying long-read series, reported by Laura Hughes (launched 22 October 2025), is the output of a two-year investigation arguing that the UK faces an unrecognised childhood lead-poisoning epidemic. The series opens with the death of a toddler in Leeds from lead poisoning and includes statements that "millions" may be unknowingly at risk, prompting the UK government in late 2025 to reconsider routine childhood blood-lead screening (a citizen-led study has since launched per GOV.UK). Specific national blood-lead level distributions are not provided in the publicly accessible podcast summaries; the relevant statutory action level remains 5 µg/dL under the UK Lead Exposure in Children Surveillance System. Sources of lead surfaced across the series: deteriorating lead paint in older housing, lead water-pipe and solder legacy, contaminated food and consumer products, and gaps across housing, environmental, and food standards systems. The author's pointed framing: "officials do not know how big the problem really is."

Heavy metal contamination in urban agriculture: evidence from Nairobi

Murphy et al. Environmental Science and Pollution Research. October 2025, https://link.springer.com/article/10.1007/s11356-025-37030-x [LID 29336]

Kenya, Nairobi County. National in scale (Kenya), with implications for food-safety surveillance in any LMIC reliant on informal urban agriculture. Murphy and colleagues used a random geographical sampling strategy to recruit dark-leafy-greens farmers across Nairobi, supplementing with kale samples from peri-urban wholesale markets. Samples were analysed at the Kenya Plant Health Inspectorate Service (KEPHIS) for lead, cadmium, and mercury. Mean lead contamination was 0.68 mg/kg (0.68 ppm); cadmium 0.09 mg/kg; mercury 0.11 mg/kg. Spatial analysis shows crops grown closer to roadways carry higher lead, and those near industrial sites carry higher mercury; native indigenous greens and out-of-county kale offered no clear contamination advantage. Combining contamination with dietary intake data, the authors estimate that 71% of adults and 69% of children consuming leafy greens in their sample exceed daily reference intakes for lead, with 12% exceeding cadmium and 52% exceeding mercury reference levels via greens alone. No blood lead level measurements are reported; exposure is modelled from food. Sources of lead named: residual contamination from leaded petrol along roads, urban industrial emissions, contaminated irrigation water from open drainage channels, and historical soil contamination. The pointed finding is that a public-health recommendation to increase leafy-green intake for micronutrients sits in tension with current contamination levels.

2023 Volcano Art Prize
Shitemi Owen: *Anti Lead in Paint Campaign Cake:* Lead-Safety Message: This cake symbolises the successful work of the University of Nairobi Chemistry Students Association and Basco Paints of raising lead poisoning awareness and introducing lead-free paints to Kenya. **Description of Work:** Marks the 10-year anniversary of the WHO International Lead Poisoning Prevention Week of Action 2022 campaign to ban lead paints. https://volcanoartprize.com/portfolio-item/anti-lead-in-paint-campaign-cake/ [LID 27630

Lead Exposure and Antisocial Behavior: A Systematic Review of Human and Animal Evidence

Shaffer et al. Environment International. November 2025, https://www.sciencedirect.com/science/article/pii/S0160412025005379?utm_source=lead-update.cgdev.org [LID 29337]

Global evidence base spanning human cohort and animal toxicology studies. Global in scale, with implications for public health, criminal justice, and policy framings that link environmental lead to behavioural outcomes. Shaffer and colleagues conducted a systematic review (registered protocol, 2022) of peer-reviewed epidemiological and toxicological literature in PubMed, BIOSIS, and Web of Science through June 2024. From more than 15,000 records screened, 43 epidemiological studies and 37 animal studies met inclusion. Outcomes assessed include aggression, conduct and antisocial personality disorders, and violation of social norms (delinquency and crime). The review concludes that there is a likely causal association between lead exposure and antisocial behaviour, with the strongest human evidence for violation of social norms (rated moderate certainty) and converging animal evidence for aggression. The synthesis does not pool a single dose-response curve but is consistent with effects extending into the low blood-lead range relevant to contemporary populations (no µg/dL threshold is asserted; the underlying primary studies span historical and contemporary BLLs). Sources of lead are not quantified in the review since it is a meta-analytic synthesis, but the included primary studies span leaded gasoline, paint, occupational, and dietary exposures.

Significant reduction of blood and tissue lead and cadmium concentrations in free-range and broiler chickens through soil remediation with biochar, phosphates, and calcined dolomite: Implications for public health and food safety

Tembo et al. Journal of Hazardous Materials Advances. November 2025, https://www.sciencedirect.com/science/article/pii/S2772416625003183?utm_source=lead-update.cgdev.org [LID 29338]

Zambia, with field setting in Kabwe, the same legacy lead and zinc mining town discussed in the ACTSA report (LID 29334). National in scale, with implications for any region where ULAB recycling or mining contaminates poultry-rearing soils. Tembo and colleagues evaluated four soil amendments, biochar, triple superphosphate, phosphoric acid, and calcined dolomite, for their capacity to immobilise lead and cadmium in contaminated soils and thus reduce concentrations in free-range and broiler chicken blood, liver, and kidney. The publicly visible abstract describes "significant" reductions in blood and tissue lead and cadmium across treated groups relative to untreated controls; specific percent reductions and µg/g tissue values were not retrievable through web search and the

ScienceDirect full text was bot-blocked in this pass. Sources of lead addressed: legacy mining and smelting contamination of household-yard and free-range chicken-rearing soils in Kabwe, with food-chain implications for residents who consume their own poultry and eggs. No human blood lead level values are reported; the human-health implication is dietary (food safety) rather than direct measurement. The authors position the work as a low-cost, locally sourceable amendment package for mine-affected households.

2020 Volcano Art Prize
Elizabeth O'Brien: *Is my breakfast lead poisoning me?:* Lead-Safety Message: Is there too much lead in my breakfast or is the lead leaching out of my bones now that I'm 64, or both? **Description of Work:** iPhone 8 photos collaged in Powerpoint. https://volcanoartprize.com/portfolio-item/is-my-breakfast-lead-poisoning-me/ [LID 19828]

UK reconsiders screening for lead poisoning in children

Laura Hughes. Financial Times. November 2025, https://www.ft.com/content/e27fffd8-a698-4137-b9be-71d9b00f37f1 [LID 29339]

United Kingdom, national. National in scale, with implications for screening policy across other high-income countries that do not currently mandate childhood blood-lead testing. The Financial Times news article by Laura Hughes (paywalled, accessed via syndicated coverage and the author's own public summaries) reports that the UK government is reconsidering whether to introduce routine blood-lead screening for children, following the FT's two-year "Untold: Toxic Legacy" investigation, which argues that millions of UK children may be unknowingly at risk from the toxic metal. The framing connects deteriorating lead paint in older housing stock, lead and copper plumbing fittings, and the contribution of over 6,000 abandoned lead mines reportedly leaking hundreds of tonnes of metals into UK rivers each year, to a likely under-detected childhood exposure burden. The article does not present new BLL distributions: the relevant UK reporting threshold is 5 µg/dL under the Lead Exposure in Children Surveillance System (LEICSS); routine population screening would be a substantive policy shift. Sources of lead summarised: paint in pre-1992 housing, lead pipes and solder, contaminated food, and abandoned-mine drainage into water supplies.

SON, NGO train 35 lab experts to battle lead poisoning

Ozolua Uhakheme. The Nation. November 2025, https://thenationonlineng.net/son-ngo-train-35-lab-experts-to-battle-lead-poisoning/?utm_source=lead-update.cgdev.org [LID 29340]

Nigeria, with training held at the Standards Organisation of Nigeria (SON) Lagos office and participants drawn from multiple states (Kano cited). National in scale, with implications for the National Interagency Working Group on Lead Poisoning Elimination (see LID 29321). The Nation reports a two-day capacity-building workshop organised by SON in partnership with Resolve to Save Lives Nigeria, training 35 laboratory experts from regulatory, academic, and state agencies in

operation and field use of X-ray fluorescence (XRF) analysers for lead detection in consumer products. SON Deputy Director Adetoyi Adeyinka and Resolve to Save Lives Executive Director Nanlop Ogbureke both frame the work as evidence-gathering ahead of enforcement of lead-elimination regulations, with explicit reference to lead-related child deaths in Zamfara and Niger states. South Africa-based facilitator Mirko Steinhage of Spectrometer Technologies led the practical XRF, radiation-safety, and software components. No new blood lead level data are reported. Sources of lead targeted by the screening programme: cosmetics (including lipstick and traditional "tiro" eye applications), toys, paints, water, and broader consumer products under SON and NAFDAC remit.

The sinister alchemy that puts lead into Zambian children's veins

The Continent. November 2025, https://continent.substack.com/p/the-sinister-alchemy-that-puts-lead?utm_source=lead-update.cgdev.org [LID 29341]

Zambia, with focus on Kabwe in Central Province, the same legacy lead and zinc mining town examined in LIDs 29334 (ACTSA) and 29338 (Tembo). Local in immediate scope, with national, regional, and pan-African implications via the ongoing class action against Anglo American in South African courts. The Continent (a pan-African weekly) profiles the slow-motion poisoning of roughly 200,000 Kabwe residents from the legacy Broken Hill mine (operated from 1906, closed 1994) and the persistent "Black Mountain" of mine waste. The article cites that 95% of children sampled in affected townships have elevated blood lead levels and approximately 50% meet the threshold the World Health Organization (WHO) describes as requiring urgent chelation; specific µg/dL cutoffs are not quoted in the article but correspond to the WHO 5 µg/dL action level and the >45 µg/dL chelation threshold widely used in Kabwe screening studies. Documented sequelae in children include anaemia, respiratory illness, school absenteeism, and behavioural change. Sources of lead named: residual mine tailings and waste rock, with secondary pathways through soil, vegetation, water, and dust. The piece previews the 140,000-claimant class action in South African courts, with decisions expected in 2026.

2025 Volcano Art Prize

Jenny Rowbotham: *Broken Hill Monitoring System:* Lead-Safety Message: Why does air monitoring equipment appear non-functional at Broken Hill given the discrepancy between reported low airborne lead emissions (95 kg in 2015/16) versus 1.6 million kg transferred to tailings storage in the same year? Regulatory scrutiny of mining operations data is needed. **Description of Work:** Data from the National Pollutant Inventory combined with smartphone photographs and digital collage in PowerPoint and Paint. https://volcanoartprize.com/portfolio-item/broken-hill-monitoring-system/ [LID 28966]

Protecting Americans' Health Starts with Fixing Our Country's Lead Problem

Fitzgerald and Greene. Earth Justice. November 2025, https://earthjustice.org/article/protecting-americans-health-starts-with-fixing-our-countrys-lead-problem [LID 29406]

United States, national in scale, with named hotspots in Alabama, Missouri, New York, and California, plus airport-emission concentrations across California, Florida, Arizona, Washington, and Colorado. National in scope, with implications for several EPA rulemakings due to finalise by December 2025. Fitzgerald and Greene argue that despite a half-century of progress since the phase-out of leaded petrol, the United States is not yet free of lead and the current EPA is weakening rather than strengthening protections. They identify three under-addressed pathways: emissions from large municipal waste combustors that burn lead-containing materials; leaded aviation gasoline still used by roughly 170,000 piston-engine aircraft at 20,000 airports, accounting for around 70% of remaining atmospheric lead releases and exposing over 5 million people (including 360,000 children under five) living near these airports; and secondary lead smelters and battery recyclers, with cited community impacts in Alabama, Missouri, New York, and California. No specific blood lead level values are reported in the article; the framing rests on the now-standard position that there is no safe level of lead exposure, especially for children. Policy levers urged: finalise stronger Large Municipal Waste Combustor emissions limits, phase out leaded avgas, tighten secondary-lead-smelter Clean Air Act standards, and update the Lead National Ambient Air Quality Standards, last revised in 2008. Sources of lead named: waste-combustor stack emissions, leaded aviation fuel, and secondary lead smelter and battery-recycling air emissions.

A Study to Assess the Awareness Regarding Lead Poisoning among Students of Selected Secondary Schools at Unguja, Zanzibar

Okafor et al. International Journal of Biochemistry Research & Review. November 2025, https://journalijbcrr.com/index.php/IJBCRR/article/view/1061/2280 [LID 29406]

Tanzania, with field work in selected secondary schools on Unguja Island, Zanzibar; the lead author is affiliated with the State University of Zanzibar, the same institutional anchor as the related occupational lead-exposure work in LID 29367. Local in immediate scope, with regional implications for school-based health-literacy programming across East Africa where childhood lead exposure remains under-recognised. Okafor and colleagues, publishing in the International Journal of Biochemistry Research & Review, set out to assess what adolescents already know about lead poisoning: its sources, its health effects, and the behaviours that reduce or amplify risk. The article is the first peer-reviewed Zanzibari adolescent lead-awareness assessment of which we are aware. The journal landing page on journalijbcrr.com is Cloudflare-protected and was not retrievable through automated fetches in this pass, so specific sample sizes, awareness percentages, and statistical associations between demographic variables and knowledge scores could not be quoted; full quantitative findings should be incorporated when the PDF is obtained through Liz's institutional access. No blood lead levels are measured in this study: the design is knowledge, attitudes, and practices (KAP) rather than biomonitoring. Sources of lead implicit in the topic framing (and consistent with the East African evidence base): leaded paint in older school and residential buildings, used lead-acid battery (ULAB) recycling, contaminated cosmetics, ceramic glazes, and contaminated soil and dust. The work is positioned as groundwork for school-curriculum integration and community awareness programming.

Millions of Children Need Life-Changing Lead Poisoning Medicine. Why Isn't It Affordable?

Theo Mitchell and Rachel Bonnifield. Center for Global Development (CGD). November 2025, https://www.cgdev.org/blog/millions-children-need-life-changing-lead-poisoning-medicine-why-isnt-it-affordable [LID 29224]

Global, with quantified national populations of severely lead-poisoned children: roughly 1 million in India, 200,000 in China, and 100,000 in Nigeria, plus the Nigerian artisanal-gold-mining case as the framing exemplar. Global in scale, with implications for the WHO Essential Medicines List, donor-funded prequalification, and chelation supply chains across low- and middle-income countries (LMICs). Mitchell and Bonnifield argue that the world has the clinical means to treat the most severely poisoned children but lacks affordable global supply of the necessary medicines. The chelating agents discussed are succimer (also known as DMSA, the preferred oral option in the 45 to 70 µg/dL blood lead range), D-penicillamine (an existing oral option, narrowly usable because of serious side effects), and unnamed non-oral chelation drugs delivered parenterally in inpatient settings for cases above 70 µg/dL (the BLL window in which calcium disodium EDTA and dimercaprol / BAL have historically been used internationally). The cost gap is structural: a course of succimer can run to USD 500 to 1,000 in low-income settings, an Indian generic is available at around USD 150 per 1,800 mg course, and unlicensed European supplement versions sit as low as USD 8. The authors call for adding succimer to national Essential Medicines Lists, expanding WHO prequalification (and the WHO-Listed Authority pathway) for chelation drugs, and donor signalling to fund the ~USD 600,000 upfront prequalification cost for a generic manufacturer. Sources of lead in the framing population: artisanal gold mining (Nigeria), ULAB recycling, and contaminated consumer products driving the broader LMIC BLL burden.

Does Lead Exposure Really Kill Five Million People Per Year? (Probably, Yes)

Lee Crawfurd. Center for Global Development. November 2025, https://www.cgdev.org/blog/does-lead-exposure-really-kill-five-million-people-year-probably-yes [LID 29408]

Global, with the headline estimate of approximately 5.5 million adult deaths in 2019 from lead-attributable cardiovascular disease drawn from Larsen and Sánchez-Triana (2023). Global in scale, with implications for how lead is ranked against HIV/AIDS and malaria in global-health priority setting. Crawfurd interrogates whether the now-widely-cited 5.5 million figure is plausible, and concludes that it likely is. The observational dose-response data sit at a relative risk ratio of about 1.5 for cardiovascular mortality at the mean low- and middle-income country (LMIC) adult BLL of around 5 µg/dL (50 µg/L). To pressure-test that, Crawfurd cross-validates against two quasi-experimental studies that exploit natural variation in lead exposure: Hollingsworth and Rudik's use of NASCAR race-track exposure, and Fletcher and Noghanibehambari's use of historical proximity to lead service pipes as an instrumental variable. Both yield a relative risk closer to 2.0, slightly above the observational data, supporting rather than undermining the headline estimate. The standout framing: "That's more people than died of HIV/AIDS and malaria combined." No new blood lead level distributions are reported; the population BLL inputs are the GBD 2019 and WHO 5 µg/dL action-level estimates. Sources of lead are not enumerated in this analytical blog: the focus is the dose-response statistics and inferential reliability. Crawfurd registers "reasonably high confidence" in the order of magnitude while explicitly calling for more causal LMIC studies.

Recycling Lead for U.S. Car Batteries Is Poisoning People

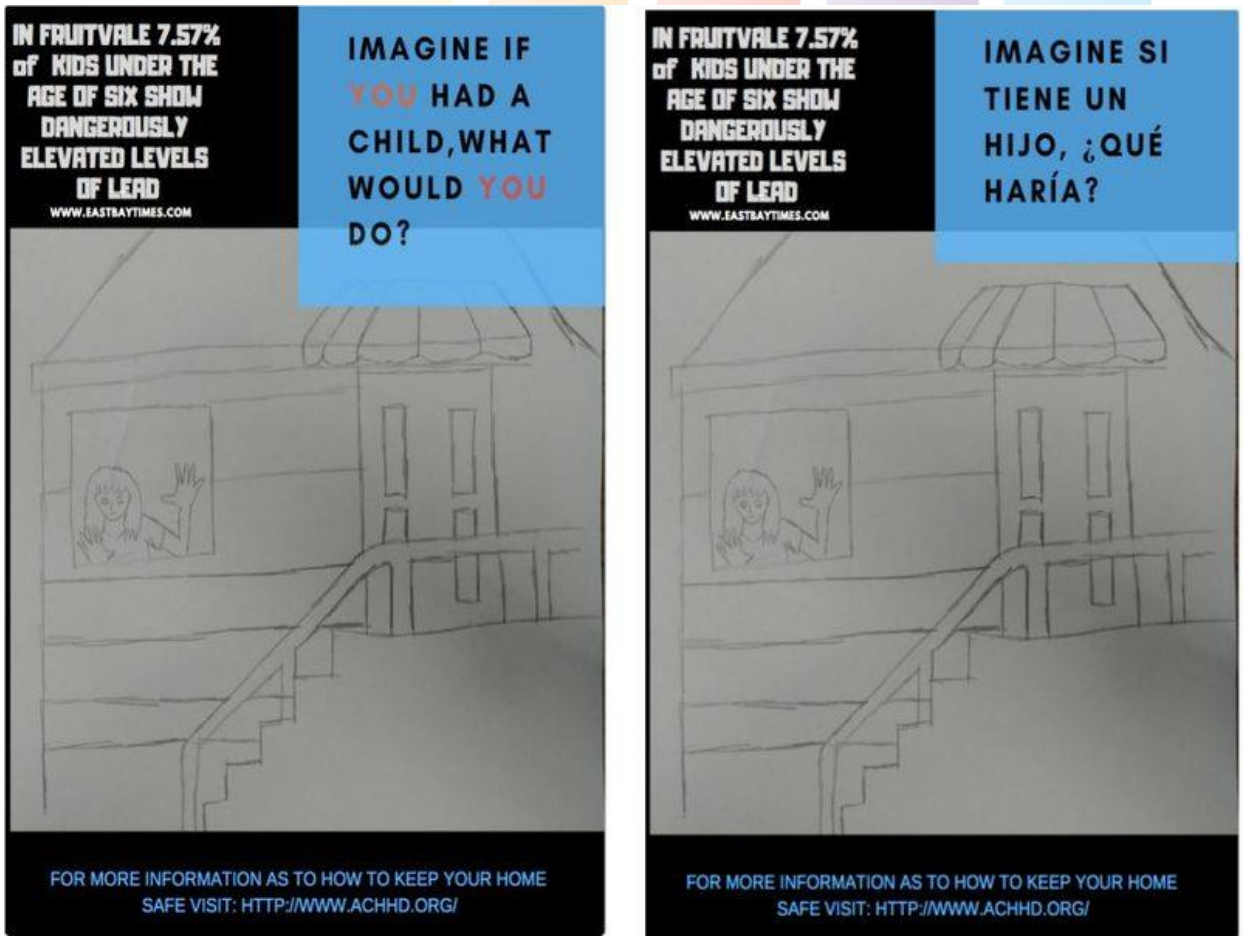
Peter S. Goodman et al. The New York Times. November 2025, https://www.nytimes.com/interactive/2025/11/18/world/africa/lead-poisoning-car-battery.html [LID 29342]

Nigeria, focused on Ogijo (Ogun State, near Lagos), with comparative material from Togo, Tanzania (Dar es Salaam), Ghana, and California (Vernon). National in scale for Nigeria, with global implications for the auto and battery industries' lead supply chains. Goodman and colleagues, reporting for The New York Times in partnership with The Examination, ran independent blood lead testing on 70 Ogijo residents and workers via Sustainable Research and Action for Environmental Development (SRADev Nigeria). Seven of ten residents had harmful blood lead levels (BLLs) and every recycling worker tested was poisoned; more than half of children tested had BLLs the authors describe as capable of causing lifelong brain damage. Profiled cases include 5-year-old Samuel Bakare at 15 µg/dL (three times the WHO action level of 5 µg/dL), his 8-year-old brother Israel at higher still, and their mother Oluwabukola Bakare at 31.1 µg/dL, a range associated with miscarriage and preterm birth. Dust and soil samples reached 186 times generally recognised hazard thresholds; one school yard measured >1,900 ppm soil lead against 95 ppm at the Vernon, California preschool that triggered a US environmental-disaster designation. Sources of lead: informal used lead-acid battery (ULAB) recycling smelters (True Metals named) supplying lead to battery makers serving Ford, GM, Tesla, Amazon, Lowe's, and Walmart. The reporting frames the auto industry's "recycling success story" as a globally externalised poisoning.

The Auto Industry Was Warned: Battery Recycling Was Poisoning People

Will Fitzgibbon. The New York Times. November 2025, https://www.nytimes.com/2025/11/25/world/africa/lead-battery-recycling-pollution-cars.html [LID 29343]

Global supply chain investigation by The New York Times in partnership with The Examination; site reporting from Nigeria (Lagos/Ogijo), Ghana, Tanzania, Mexico, and India. Global in scale, with implications for automotive sustainability disclosure regimes that have so far excluded lead. Fitzgibbon's companion piece to LID 29342 documents nearly three decades of internal industry awareness that informal lead recycling was poisoning workers and host communities, and serial industry blockages of voluntary certification: the 2005 "Green Lead" proposal pitched to Ford by Australian lawyer Phillip Toyne; the 2007 BEST Standard 1001 pilot in India that no major manufacturer joined; and the 2011 to 2012 ASTM International process in which Johnson Controls (now Clarios) sent 50 representatives to a voting meeting, dominating 80 of 98 seats and ending the standards drive. Retired Ford executive Bernd Gottselig acknowledged the abatement was "financially challenging". The article re-cites the investigation's blood lead testing of children near Lagos showing levels capable of lifelong brain damage; the specific µg/dL values are reported in the companion piece (15 µg/dL in 5-year-old Samuel; 31.1 µg/dL in his mother) rather than here. Sources of lead: informal and semi-formal used lead-acid battery (ULAB) recycling smelters whose output enters automotive supply chains via global trading houses. Named makers include Ford, GM, Tesla, Stellantis, Hyundai, Volkswagen, BMW, Nissan, Volvo, and Clarios, with most declining to address the findings or excluding lead from sustainability reporting.



2020 Volcano Art Prize
Yurayma, Chris, Brian: ***In Fruitvale 7.57% of Kids under 6 Show Elevated Blood Lead:*** **Lead-Safety Message:** The incidence of elevated levels of lead is very high in our neighborhood, and we made this poster to teach people about this issue. **Description of Work:** Poster created by three 15-year-old students from ASCEND TK-8 School in Oakland's Fruitvale District. https://volcanoartprize.com/portfolio-item/in-fruitvale-7-57-of-kids-under-6-show-elevated-blood-lead/ [LID 19870]

UK to launch first lead poisoning screening study of children after FT investigation

Laura Hughes. Financial Times. November 2025, https://www.ft.com/content/f2bba700-8399-4777-99ba-c68f16b427b9 [LID 29344]

United Kingdom, with the pilot launched in Leeds and run from Northumbria University. National in scale, with implications for the case for routine paediatric lead screening across the UK and comparable high-income jurisdictions that have so far treated childhood lead as a residual issue. Hughes's Financial Times piece reports that the UK government, following a two-year FT investigation, is launching its first citizen-led childhood lead screening study, directed by Professor Jane Entwistle (Northumbria University). The pilot is framed as groundwork for nationwide testing of one- and two-year-olds, a measure already urged by approximately 50 MPs, peers, and academics in submissions to Health Secretary Wes Streeting; the Social Market Foundation has called for universal screening. The article and accompanying coverage cite an estimate of roughly 200,000 UK children with undiagnosed lead exposure. No new blood lead level concentrations are published in the article; the FT series previously documented elevated paediatric BLLs near abandoned lead mines and in

households exposed to imported spices and traditional cosmetics. Sources of lead named or implied: legacy mine waste contaminating soil and food chains, deteriorated paint, drinking water, imported spices, sindoor, kohl, and traditional medicines. The framing is pointed: routine paediatric BLL surveillance, taken for granted in the US, remains absent in the UK.

Personalized lead exposure information and preventive behaviors in Ivory Coast: Insights from a pilot study

Gille et al. PLOS One. November 2025, https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0336949 [LID 29345]

Ivory Coast (Côte d'Ivoire), with field work in Abidjan. Local in immediate scope, with implications for behaviour-change interventions that pair point-of-use lead screening with risk communication, transferable across LMICs where lead paint remains in use. Gille and colleagues ran a pilot with 153 pregnant women between September 2023 and March 2024, visiting each three times and delivering personalised exposure information generated from in-home X-ray fluorescence (XRF) analysis alongside generic risk education. Participants whose homes tested lead-positive were 33 to 35 percentage points more likely to acknowledge their exposure risk than those receiving only generic information; among mothers of young children, the personalised arm was 23 percentage points more likely to prevent children from ingesting paint chips and 41 percentage points more likely to increase handwashing. No effects were seen on home cleaning or renovation behaviours. The study did not measure children's blood lead levels: the authors flag this as a key limitation and call for BLL-validated follow-up. Background screening showed 14 of 23 paint samples exceeded 500 ppm, confirming the magnitude of the exposure source. Source of lead: lead-based paint in domestic interiors. The work is positioned as a low-cost behavioural complement to regulatory bans on lead paint.

EPA to provide $3 billion to US states to reduce lead in drinking water

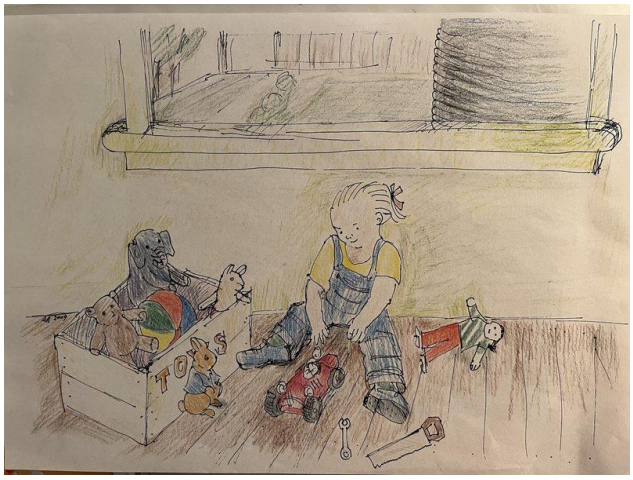
Reuters. November 2025, https://www.reuters.com/legal/litigation/epa-provide-3-billion-us-states-reduce-lead-drinking-water-2025-11-25 [LID 29346]

United States, federal allocation to the 50 states via State Revolving Fund (SRF) programs. National in scale, with relevance to lead service line replacement efforts referenced in LIDs 29313 (Buffalo) and 29314 (Chicago). Reuters reports that the US Environmental Protection Agency (EPA) announced USD 3 billion in new Drinking Water State Revolving Fund (DWSRF) money on 25 November 2025 to accelerate lead service line replacement, plus redistribution of USD 1.1 billion in previously awarded but unspent funds to states with active lead pipe replacement needs. The agency revised its national estimate downward from 9 million to roughly 4 million lead service lines, reflecting better inventory data submitted under the Lead and Copper Rule Revisions. States that have neither obligated nor spent prior awards since FY2023 must submit a remediation plan before becoming eligible for new funding, an accountability lever directly relevant to underspenders like the Buffalo Urban Renewal Agency (LID 29313). No blood lead level data are included in the announcement; the framing is infrastructure exposure reduction rather than population BLL outcomes. Source of lead: lead service lines, gooseneck connectors, and lead-containing premise plumbing in pre-1986 housing and commercial buildings.

A World Without Lead: Paving the Path to a Healthy, Productive Future

World Bank. November 2025, https://www.worldbank.org/en/topic/environment/publication/a-world-without-lead-paving-the-path-to-a-healthy-productive-future [LID 29347]

Global, with concentrated focus on low- and middle-income countries (LMICs) where exposure and economic burden cluster. Global in scale, framed as a development priority on a par with mainstream World Bank environmental and human-capital agendas. The World Bank's flagship lead report synthesises the 2019 burden-of-disease and human-capital data: 765 million IQ points lost globally to childhood lead exposure, USD 1.4 trillion in lost lifetime income, and 5.5 million adult deaths from cardiovascular disease attributed to lead, totalling roughly a trillion-dollar annual economic drag. The report restates the now-uncontroversial position that there is no safe level of lead in the body and that the affected populations are disproportionately pregnant women, infants, children, and the poor. No new blood lead level concentrations are published; the document draws on existing IHME and Bjorn Larsen and Roy Sanchez-Triana modelling. Sources of lead named: used lead-acid battery (ULAB) recycling (cited as 86% of all lead mined or recycled), industrial smelting and mining, lead paint, lead service lines, cosmetics, toys, contaminated spices, and adulterated teas. Recommended policy levers: site remediation, enforceable national standards, institutional capacity, and high-level political commitment to elimination. The publication functions as the Bank's formal entry into the Partnership for a Lead-Free Future coalition framing.



2025 Volcano Art Prize
Anne Roberts: *Toddler with Toys:* Lead-Safety Message: A LEAD Group Kit is a fantastic tool for detecting lead in a toddler's environment through lab analysis of surface dust wipes from the playfloor and window sill, bare soil, water from brass taps installed in the last 3 years, from rain tanks or bores, paint, toy paint and ceiling cavity dust or vacuum dust.
Description of Work: Created using colouring pencils and pen on paper, this artwork communicates lead-safety information sourced from the Lead Safe World Project's page on DIY sampling and lab analysis testing kits. https://volcanoartprize.com/portfolio-item/toddler-with-toys/ [LID 28898]

Industry and consumer products as lead exposure sources among children across 3 regions in Ghana

Nash et al. Environmental Research. December 2025, https://www.sciencedirect.com/science/article/pii/S0013935125022662?via%3Dihub [LID 29348]

Ghana, with field sampling across three regions: Greater Accra, Ashanti, and Northern. National in scale (these three regions house the bulk of the survey population), with implications for the broader Pure Earth and UNICEF Global Initiative to End Childhood Lead Poisoning to which Ghana acceded in 2024. Nash and colleagues report the Environmental Research peer-reviewed analysis of the joint Ghana Health Service, Pure Earth Ghana, and UNICEF national blood lead survey: 3,227 children aged 1 to 5 were sampled, of whom 1,725 (53.5%) had blood lead levels (BLLs) at or above 5 µg/dL, the WHO action threshold. Children living near the two formal used lead-acid battery (ULAB) recycling plants in Greater Accra recorded BLLs at or above 45 µg/dL, the WHO chelation threshold. Home-based assessments and product testing identified three dominant exposure pathways: contaminated soil (particularly near ULAB recycling and informal industrial sites), locally fabricated aluminium and

metallic cookware (high-lead solder and scrap inputs), and traditional eye cosmetics, principally chilo, kohl, and kaji kaji. Additional contaminated items included white baked clay (shire, ayilor, farinkasa) and turmeric. Sources of lead: ULAB recycling, informal metal cookware fabrication, traditional cosmetics, ceramic dishware, and adulterated spices. The paper formalises the underlying survey behind earlier Ghana press coverage.

Early life lead exposure as a risk factor for aggressive and violent behaviour in young adults: A systematic review

Obamuyide et al. Aggression and Violent Behavior. December 2025, https://www.sciencedirect.com/science/article/pii/S135917892500059X [LID 29349]

Global synthesis, with included studies disproportionately from the United States and other high-income settings; the authors note the under-representation of LMIC evidence. Global in scale, with implications for the long-running "lead-crime hypothesis" debate and for justice-system policy. Obamuyide and colleagues searched 17 electronic databases through October 2024 and identified 17 manuscripts meeting inclusion criteria, in which lead exposure was indexed by blood lead in 12 studies, bone lead in 3, and dentine lead in 2. Outcomes spanned self-reported aggression, recorded violent offending, and validated aggression inventories in young adults. The review concludes consistent positive association between early childhood lead exposure and aggressive or violent behaviour in young adulthood, supporting environmental lead control as a population-level violence-prevention lever. The publicly available abstract does not pool a quantitative effect estimate; individual BLL ranges across included studies span the low-to-moderate childhood exposures characteristic of the leaded-petrol-era US cohorts. The authors flag the dearth of high-quality LMIC evidence as the principal evidence gap. Sources of lead in the included studies: legacy leaded petrol, lead paint, contaminated soil, and occupational exposure pathways feeding into childhood blood lead burden.

Towards a Lead-Free India: Understanding Risks and Shaping Responses

Pahlé India Foundation. December 2025, https://www.linkedin.com/posts/ilppw2025-leadfreefuture-publichealth-ugcPost-7388520146828554240-u3IQ/ [LID 29409]

India, with research and surveillance sites named in Odisha, Meghalaya, and Mizoram, and the institutional network spanning seven All India Institute of Medical Sciences (AIIMS), the ICMR-National Institute of Nutrition (NIN), the ICMR-National Institute of Occupational Health (NIOH), and state National Health Missions in Kerala and Meghalaya. National in scale, framed around International Lead Poisoning Prevention Week (ILPPW) 2025. The post summarises a national webinar co-hosted by Pahlé India Foundation (PIF) and UNICEF, "Towards a Lead-Free India: Understanding Risks and Shaping Responses", convened around 23 October 2025. Headline commitments from the discussion: BLL surveys are underway across seven AIIMS institutions, alongside PIF-led lead exposure studies in Odisha, Meghalaya, and Mizoram; UNICEF reaffirmed advocacy for India's inclusion in the Partnership for Lead-Free Future; the Government of Meghalaya announced plans to integrate lead testing into Integrated Child Development Services (ICDS) cookware procurement; and ICMR-NIOH committed to a nationwide biomarker analysis to underpin evidence-based action. The Center for Global Development (CGD) is named among participating organisations. No specific blood lead level concentrations are quoted; the AIIMS surveys, Odisha-Meghalaya-Mizoram studies, and ICMR-NIOH biomarker work are positioned as the source of forthcoming national BLL data. Sources of lead implicit in the policy levers named: contaminated cookware (the Meghalaya ICDS lever), ULAB recycling, adulterated spices and cosmetics, and

occupational exposure (the ICMR-NIOH biomarker remit). The framing closes on nutrition-linked interventions, community awareness, and policy integration as the joint route to a lead-free future.

Methylation-enriched Telomere Length Mediates the Association between Lead Exposure and Cognitive Function in an Aging Population

Li et al. Regenesis Repair Rehabilitation. December 2025, https://www.sciencedirect.com/science/article/pii/S2950575525000498 [LID 29350]

United States, drawing on the National Health and Nutrition Examination Survey (NHANES) sample of older adults. National in scale, with implications for the dementia-prevention literature and for occupational and environmental health surveillance of ageing cohorts. Li and colleagues analysed 1,661 NHANES participants aged 60 and older to test whether methylation-predicted telomere length (mTL), estimated using the Horvath DNA methylation clock, mediates the association between blood lead and cognitive function. Lead exposure showed a dose-dependent association with cognitive impairment: participants in the highest blood lead quartile (Q4) had significantly lower composite cognitive scores than those in the lowest quartile (Q1), and continuous blood lead was inversely associated with cognitive performance. Mediation analyses indicated that shortened mTL partially mediates the lead-cognition association, supporting accelerated biological ageing as a mechanism. The publicly visible abstract reports quartile cutoffs in the µg/dL range typical of NHANES adults but does not state exact threshold values; the ScienceDirect full text was bot-blocked in this pass. Sources of lead in the NHANES adult population: cumulative low-level lifetime exposure (legacy leaded petrol and paint, drinking water, occupational, and dietary), without identification of a single dominant source. The paper extends mechanistic support for the cumulative-exposure account of late-life cognitive decline.

Cross-sectional associations of self-reported firearm use with blood lead concentrations in a nationally representative cohort of US adults

Day et al. Environmental Epidemiology. December 2025, https://journals.lww.com/environepidem/fulltext/2025/12000/cross_sectional_associations_of_self_reported.7.aspx [LID 29351]

United States, nationally representative civilian adults via the National Health and Nutrition Examination Survey (NHANES). National in scale, with implications for firearm-range occupational health, hunting communities, and the broader debate over lead ammunition phase-out. Day, Braun, and Hoover pooled five NHANES cycles, combining blood lead with self-reported firearm noise exposure (1999 to 2004, n = 9,606) and firearm use (2011 to 2012 and 2015 to 2016, n = 5,972). Median blood lead was 15 µg/L (IQR 10 to 22; ~1.5 µg/dL) in the earlier cohort and 8.8 µg/L (IQR 5.7 to 14; ~0.9 µg/dL) in the later cohort. Self-reported firearm noise exposure was associated with a 15% higher blood lead concentration (95% CI 7% to 23%). Firearm use overall was not significantly associated, but a dose-response trend emerged: 1% lower (1 to 1,000 rounds), 9% higher (1,000 to 10,000), and 21% higher (10,000+ rounds), trend p = 0.07. The authors conclude that high-volume firearm users carry detectably higher BLL. Sources of lead named: lead bullet fragments and lead-containing primer aerosolised on discharge, "take-home" contamination on clothing, game-meat ingestion, and lead accumulation in firing-range soils.

2022 Volcano Art Prize
Lucinda Curran: ***Clean Up After Your Reno - prevent lead poisoning; protect our kids, pets, wildlife and our future:*** **Lead-Safety Message:** Not all hazards are visible or obvious when renovating; collect and dispose of paint chips properly using drop sheets to prevent exposure among children, pets, and wildlife. **Description of Work:** Digital art incorporating photographs of a recently renovated house. https://volcanoartprize.com/portfolio-item/clean-up-after-your-reno-prevent-lead-poisoning-protect-our-kids-pets-wildlife-and-our-future/ [LID 26405]

Cautious Signs of Progress on Lead Exposure in Bangladesh

Lee Crawfurd and Caroline Mallory. Center for Global Development. December 2025, https://www.cgdev.org/blog/cautious-signs-progress-lead-exposure-bangladesh-0?utm_source=lead-update.cgdev.org [LID 29352]

Bangladesh, with country-wide framing and specific reference to Dhaka. National in scale, with implications for the UNICEF and Pure Earth Global Initiative as a putative success case. Crawfurd and Mallory's CGD blog summarises new survey data showing Bangladesh's average childhood blood lead level (BLL) has declined from 70 µg/L (≈7.0 µg/dL) estimated in 2023 to 52 µg/L (≈5.2 µg/dL) in 2025; 38% of children remain above the WHO 50 µg/L action threshold, equating to roughly 20 million children with measurable IQ and educational losses. Dhaka prevalence among children aged 2 to 4 dropped from 75% to 65% between 2022 and 2025. Approximately 7.5% of pregnant women showed exposure with maternal-foetal transfer implications. The authors credit a multi-pronged response since 2020: youth-led activism against illegal smelters, regulatory enforcement, public education, and the dramatic collapse of turmeric adulteration with lead chromate (from 47% of samples in 2019 to 0% by 2021). Sources of lead named: adulterated turmeric (now largely eliminated), informal used lead-acid battery (ULAB) recycling (now estimated to account for roughly one-third of exposure), pesticides and herbicides, lead solder in food cans, indigenous medicines, and e-waste recycling. The framing is genuinely cautious: substantive progress, not victory.

ULABs Wrapped 2025

Hugo Smith. December 2025, https://leadbatteries.substack.com/p/ulabs-wrapped-2025?utm_source=lead-update.cgdev.org [LID 29353]

Global year-in-review by Hugo Smith on Substack, with country threads on Nigeria, Bangladesh, the Philippines, China, and Brazil. Global in scale, written for the donor and advocacy audience converging on used lead-acid battery (ULAB) recycling as the lead-elimination movement's single highest-leverage source. Smith's "ULABs Wrapped 2025" frames the year as a structural shift: the launches of the Lead Acid Battery Recycling Initiative (LABRI), Lead Research for Action (LeRA), and Partnership for Battery Action; new Bloomberg Philanthropies grantmaking; and continued CGD research funding aimed at LMIC ULAB recycling. The piece cites Bangladesh's national survey, with

roughly 20 million children (38%) above 5 µg/dL blood lead, and the Berkhout and colleagues result that children near contaminated sites scored 0.48 standard deviations lower in numeracy and 0.36 standard deviations lower in general cognitive ability than peers further afield. Bangladesh analysis attributes roughly 85% of ULAB-related lead pollution to informal recyclers (estimated 10% loss rates against 2% for formal-sector smelters). Updated estimates put annual productivity losses from lead poisoning in LMICs at USD 300 to 500 billion. The Nigeria NYT investigations (LIDs 29342 and 29343) are flagged as the year's defining advocacy moment. Source of lead: predominantly informal ULAB recycling, with secondary mentions of legacy contamination and consumer products.

2025 Volcano Art Prize
Elizabeth O'Brien: *Ban Lead Ammunition:* Lead-Safety Message: Ammunition-derived lead poses health risks to everyone; household firearm ownership is associated with elevated blood lead levels in children, and EU regulations aim to safeguard children and wildlife from lead ammunition's toxic impacts. **Description of Work:** Photography depicting spent lead bullet casings discovered in a residential setting. https://volcanoartprize.com/portfolio-item/ban-lead-ammunition/ [LID 28901]

Epidemiologic Trends in Pediatric Lead Poisoning at Freestanding Children's Hospitals, 2016–2023

Hahn et al. Hospital Pediatrics. January 2026, https://publications.aap.org/hospitalpediatrics/article-abstract/16/1/85/205894/Epidemiologic-Trends-in-Pediatric-Lead-Poisoning?utm_source=lead-update.cgdev.org [LID 29355]

United States, across 47 freestanding children's hospitals reporting to the Pediatric Hospital Information System (PHIS). National in scale, with implications for inpatient burden estimation, chelation guideline implementation, and lead-screening referral pathways. Hahn and colleagues describe 2016 to 2023 trends in paediatric lead poisoning encounters captured by PHIS: 845 inpatient hospitalisations and 1,137 emergency department visits with a primary diagnosis of lead poisoning, accruing more than USD 4.5 million in mean cumulative annual billed charges. The publicly visible abstract focuses on encounter counts, demographic distribution, length of stay, and hospital-level variation rather than population blood lead level (BLL) distributions; the AAP full text was bot-blocked in this pass and specific µg/dL severity strata, chelation rates, and percent-change trend statistics could not be quoted. The work positions tertiary paediatric hospitals as a sentinel surveillance system for the residual severe end of US childhood lead exposure (cases requiring inpatient management, generally BLLs well above the CDC 3.5 µg/dL reference value and frequently above the 45 µg/dL chelation threshold). Sources of lead in this clinical population, as in earlier PHIS analyses: deteriorated lead paint in older housing, contaminated dust and soil, imported spices and traditional remedies, and lead-containing consumer products.

Lead is all around us. It could be poisoning our children

Rosa Silverman. The Telegraph. January 2026, https://www.telegraph.co.uk/news/2026/01/04/lead-could-be-poisoning-our-children [LID 29354]

United Kingdom, with case material drawn from English households. National in scale, with implications for residential property disclosure, DIY retail labelling, and primary-care training, all of which the article positions as currently inadequate. Silverman's Telegraph feature continues the FT-led press cycle (LIDs 29335, 29339, 29344) treating UK childhood lead exposure as an underestimated public-health problem. The article opens with parent Jess Draper, who feared her son had been poisoned after she sanded lead paint from a household door; Draper's framing ("we need to make lead the new asbestos") supplies the rhetorical centre of gravity. Three policy levers are foregrounded: mandatory lead risk assessment in property surveys at sale, point-of-sale hazard information in DIY and trade outlets where paint stripping supplies are bought, and GP-level training to recognise lead poisoning. No specific blood lead level concentrations are reported; the piece takes the absence of routine UK paediatric BLL screening (raised in LID 29344) as its background condition. Sources of lead named: lead-based paint in older British housing stock (banned for residential use but still present), lead plumbing in pre-1970 properties, and the dust and chip exposures generated by uninformed DIY removal. The framing is explicitly advocacy-aligned with the Lead Exposure and Poisoning Prevention Alliance (LEAPP).

Beyond Hot Spots: Estimating Population Lead Exposure from Battery Recycling

Crawfurd et al. Center for Global Development, https://www.cgdev.org/publication/estimating-population-lead-exposure-battery-recycling?utm_source=lead-update.cgdev.org [LID 29356]

Global, with explicit focus on low- and lower-middle-income countries (LMICs). Global in scale, with implications for how donors and regulators weight informal used lead-acid battery (ULAB) recycling against other lead-elimination interventions. Crawfurd and colleagues at the Center for Global Development reconcile two strands of evidence on ULAB-attributable exposure: classic "hot spot" sampling studies that document very high BLLs within hundreds of metres of smelters and yards, and newer quasi-experimental work showing detectable lead effects across far larger areas around the same sites. A simulation model integrating both strands estimates that ULAB recycling accounts for roughly 33% of population lead exposure in LMICs, against a hot-spot-only estimate near 0.5%, a roughly 60-fold revision driven by the dispersion of contamination beyond proximal zones. The report restates that approximately one in three children worldwide carries blood lead at or above harmful thresholds (the UNICEF and IHME 5 µg/dL figure); no new BLL distributions are produced here. Source of lead: informal and semi-formal ULAB recycling, the single largest by-weight use of lead globally. The implication for advocacy: most of the harm sits in the diffuse low-to-moderate range across millions of households, not solely in the headline-grabbing acute cases.

Association of Lead in Drinking Water With Head and Neck Cancer in the United States

Scussiatto et al. Otolaryngology–Head and Neck Surgery, https://pubmed.ncbi.nlm.nih.gov/41553005/ [LID 29357]

United States, ecological analysis across 608 counties in the SEER (Surveillance, Epidemiology, and End Results) cancer registry catchment. National in scale, with implications for the toxicology of low-level drinking-water lead and for the case against the EPA's lead and copper rule action level. Scussiatto and colleagues link county-level head and neck cancer incidence to EPA drinking-water lead measurements (inverse-distance-weighted from monitoring data), with adjustment for tobacco, alcohol, and demographics, and Holm correction for multiple comparisons. Higher county-level water lead concentrations were significantly associated with elevated incidence of oral and pharyngeal cancers (IRR 1.05; 95% CI 1.00 to 1.08; $p < 0.01$), gum and mouth cancers (IRR 1.03; 95% CI 1.00 to 1.08; $p = 0.02$), and oesophageal neoplasms (IRR 1.01; 95% CI 1.00 to 1.03; $p = 0.02$). The authors

emphasise that associations held below the existing EPA action limit, framing the result as evidence that no safe lead-in-water threshold exists for cancer outcomes either. The study is ecological and does not measure individual blood lead levels or individual water consumption; specific µg/L water lead exposure cutpoints are not extractable from the abstract. Source of lead: drinking water, sourced through lead service lines, premise plumbing, and lead-soldered municipal infrastructure.

Electronic Waste-Associated Lead Exposure and Child Neurodevelopment in Sub-Saharan Africa: A Systematic Review and Meta-Analysis

Yaala et al. Working Paper. January 2026, https://www.preprints.org/manuscript/202601.1358?utm_source=lead-update.cgdev.org [LID 29358]

Sub-Saharan Africa (SSA), with sub-Saharan studies anchored in Ghana (Agbogbloshie, Accra) and comparator low- and middle-income country (LMIC) studies from India, China, and Vietnam. Regional in scale, with global implications for e-waste governance under the Basel Convention. Yaala, Osei Adu, and Armah (University of Cape Coast, Ghana) ran a PRISMA-compliant systematic review and random-effects meta-analysis: 612 records screened, 12 studies in qualitative synthesis, and 5 (n = 1,492 children aged 3 to 15) in the pooled analysis. Higher e-waste-related lead exposure was associated with significantly poorer neurodevelopmental outcomes overall (pooled standardised mean difference -0.42; 95% CI -0.61 to -0.23; I-squared = 56%), with a markedly larger effect in SSA (SMD -0.58; 95% CI -0.89 to -0.27) than in non-SSA LMICs (SMD -0.35; 95% CI -0.54 to -0.16). Leave-one-out sensitivity analyses kept the pooled estimate stable (-0.38 to -0.46); funnel-plot inspection showed no strong publication bias. All included studies measured venous blood lead and used validated IQ or cognitive instruments; the authors note Ghanaian e-waste-community BLLs run several-fold above international reference values. Sources of lead: open burning of cables, manual dismantling of circuit boards, leaded solder, cathode-ray tube glass, and embedded lead-acid batteries in informal e-waste recycling streams.

Is Lead Poisoning a Missing Link in the Fight Against Malnutrition?

Crawfurd and Kandpal. CGD. January 2026, https://www.cgdev.org/blog/lead-poisoning-missing-link-fight-against-malnutrition?utm_source=lead-update.cgdev.org [LID 29359]

Global, with empirical work drawing on nationally representative surveys from India, Georgia, and Mexico. Global in scale, with implications for the integration of lead remediation into nutrition programming and stunting reduction across LMICs. Crawfurd and Kandpal's CGD blog argues that lead exposure and undernutrition are biologically and policy-wise more tightly coupled than typically treated. Lead competes with calcium during intestinal absorption and skeletal incorporation, suppresses growth hormone signalling, blunts appetite and nutrient uptake, and iron-deficient children absorb substantially more lead through the shared divalent-metal transport pathway. Empirically, the authors analyse three surveys with paired BLL and anthropometry: the 1999 India DHS (Delhi and Mumbai), the 2018 Georgia MICS, and the 2023 Mexico ENSANUT. Average child blood lead in LMICs sits near 5 µg/dL, with the India sample running roughly twice the Georgia and Mexico means. Group differences of 4 to 8 µg/dL between exposed and reference children corresponded to height-for-age z-score differences of approximately -0.13 to -0.20 standard deviations, plausibly explaining 5% to 10% of stunting risk in the high-exposure setting. Associations were context-dependent (strong in India, weak elsewhere), consistent with a non-linear dose-response. Sources of lead implied by these surveys: ULAB recycling, adulterated spices, lead paint, cosmetics, drinking water, and contaminated soil. The framing is that nutrition programmes

overlooking lead, and lead programmes overlooking nutrition, both leave gains on the table.

2024 Volcano Art Prize
Elizabeth O'Brien: *Daily Lead Detox Foods:* Lead-Safety Message: I eat 30 different plants plus mushrooms daily and take LivOn Vit C, Vit D, calcium and magnesium. I experiment with fresh ginger in every meal and fresh garlic for brekky and lunch to see if I can get my blood lead level to fall. **Description of Work:** iPhone 13 photos collaged in Powerpoint. https://volcanoartprize.com/portfolio-item/daily-lead-detox-foods/ [LID 28165]

A case report of an unconventional chronic lead poisoning resulting from daily eyelid application of kohl

Aïn et al. Practical Laboratory Medicine. January 2026, https://www.sciencedirect.com/science/article/pii/S2352551725000708?via%3Dihub [LID 29360]

Single-patient case report from France (laboratory and clinical setting), with the patient born in Rabat, Morocco, where the kohl was sourced. Individual in immediate scope, but with implications for diaspora populations in Europe and North America and for cosmetic regulation across the Maghreb and broader MENA region. Aïn and colleagues describe a 63-year-old woman who applied traditional kohl to the eyelids daily from age 20, with neurological symptoms accruing over more than 40 years: memory disturbance, spatial disorientation, persistent headache, and tingling paraesthesia of the fingers and face. Blood lead measurements reached 170 µg/L in August 2021 and 198 µg/L in January 2022 (≈19.8 µg/dL), levels the authors describe as sub-toxic but persistently elevated. Following discontinuation of kohl, blood lead fell to 98 µg/L within two months and below the 50 µg/L target after roughly one year, consistent with the published kinetic compartments (blood half-life ~50 days, soft tissue ~9.4 months, bone ~9.7 years). All four sampled kohl preparations contained 67.7% to 79.3% lead by weight, with a shiny macroscopic appearance characteristic of galena. The article frames the case as the first published 40-year-plus chronic kohl exposure in an adult and a demonstration of substantial transcutaneous and peri-ocular lead uptake. Source of lead: galena-rich traditional kohl, applied to the eyelid margin.

Blood Lead Concentrations and Depressive and Anxiety Symptoms in Childhood

Hoover et al. JAMA Network Open. January 2026, https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2844422?utm_source=lead-update.cgdev.org [LID 29366]

United States, drawing on the HOME (Health Outcomes and Measures of Environment) Study cohort based in Cincinnati, Ohio. Local cohort with national implications for low-level childhood lead exposure and adolescent mental health, an outcome domain receiving renewed attention alongside the older cognitive and behavioural literature. Hoover and colleagues followed 218 children (121 female) prospectively from 2003 to 2019, with serial blood lead measurements from age 1 through 12 and depression and anxiety assessments at age 12 using child and caregiver-reported instruments. Median within-child mean blood lead was 9.6 µg/L (≈0.96 µg/dL; IQR 7.8 to 12.6, range 4.8 to 32.4 µg/L), well below the CDC 35 µg/L (3.5 µg/dL) reference value. Each doubling of mean childhood blood lead was associated with elevated child-reported depressive symptoms (RR 1.90; 95% CI 1.00 to 3.66) and combined child-plus-caregiver depression risk (RR 1.76; 95% CI 1.12 to 2.78). The strongest association was seen for exposures around age 8 years. No overall association emerged with anxiety on the SCARED, although the school avoidance subscale was elevated (RR 1.64). The authors conclude that even low-level childhood lead exposure predicts adolescent depressive symptoms, particularly when exposure occurs in late childhood and early adolescence. Sources of lead in HOME participants: deteriorated paint, dust, and water in older Cincinnati housing stock, consistent with the cohort's longitudinal exposure profile.

2019 Volcano Art Prize
Jennifer Birch: *Lead Poisoning Diagnosis:* Lead-Safety Message: Don't let your doctor say what's best - insist on a heavy-metal poison test. **Description of Work:** Photographic work featuring the artist's dog with an explanatory caption. https://volcanoartprize.com/portfolio-item/lead-poisoning-diagnosis/ [LID 19442]

Duration-dependent Depletion of Micronutrients in Nigerian Male Workers Exposed to Lead

Okafor et al. International Journal of Biochemistry Research & Review. January 2026, https://hal.science/hal-05478647v1 [LID 29367]

Nigeria, with recruitment in Lagos and the lead author affiliated with the State University of Zanzibar (Tanzania). Local in immediate scope but with implications for occupational health surveillance across West African informal motor and battery trades. Okafor and colleagues ran a six-month cross-

sectional study of 100 male workers aged 18 to 60 (50 battery chargers, 50 auto painters), stratified within each occupation by exposure duration: less than 5 years versus 5 years or more. Blood lead level (BLL), haemoglobin, and a micronutrient panel (zinc, selenium, iron, vitamin C, uric acid) were measured. In auto painters, all five micronutrients were significantly depleted in the >5-year group; in battery chargers, depletion was steeper and more uniform, with highly significant reductions in zinc, iron, selenium, and vitamin C alongside a smaller but significant uric acid drop. The authors interpret this as a dose-duration response in which cumulative lead body burden progressively erodes the antioxidant and trace-element reserve. The publicly visible abstract did not disclose specific µg/dL BLL means or standard deviations across exposure strata; the ResearchGate and journal landing pages were Cloudflare-blocked in this pass. Sources of lead: spray-painting of motor vehicles using lead-pigmented or lead-driered paint, and informal lead-acid battery charging and refurbishment workshops. The work supplements the global literature on micronutrient interactions with cumulative occupational lead exposure (see LID 29359 for the parallel paediatric malnutrition link).

Millions exposed to lead in toothpaste, sindoor and eyeliners

Arjun Poudel. Kathmandu Post. February 2026, https://kathmandupost.com/health/2026/02/02/millions-exposed-to-lead-in-toothpaste-sindoor-and-eyeliners?utm_source=lead-update.cgdev.org [LID 29368]

Nepal, with product sampling concentrated in Kathmandu Valley and brand-level findings spanning major South Asian and multinational manufacturers. National in scale, with implications for cosmetic and oral-care regulation across South Asia, where sindoor, gajal, and herbal toothpaste circulate freely across borders. Poudel's Kathmandu Post piece reports a Centre for Public Health and Environmental Development (CEPHED) survey: 31% of tested products contained detectable lead, 24% exceeded the US and Canadian 1 ppm cosmetic limit, 27% breached the EU 0.5 ppm standard, and 16% exceeded Nepal's own 10 ppm guideline. Sindoor (vermilion powder applied at the hair parting) was the most contaminated category at 40% of samples nationally and 60% in Kathmandu Valley, with peak concentrations of 124.73 ppm. Toothpaste contamination ran at 45% with peaks of 51.28 ppm, with elevated lead reported in Himalaya Kids Orange, Colgate, Pepsodent, and Dabur Red samples. Gajal (kohl-type eyeliner) is flagged as a particular paediatric hazard given mucosal application. No new blood lead level concentrations are reported in the article: CEPHED's framing is exposure-source quantification rather than population BLL measurement. The piece calls for a sub-1-ppm statutory limit and dedicated cosmetic regulatory oversight before October 2026. Sources of lead named: sindoor (lead chromate or lead tetroxide pigments), gajal and kohl (galena-based), and adulterated or contaminated toothpaste.

A century of hair clippings show lead exposure rates have plummeted

Meghan Bartels. Scientific American. February 2026, https://www.scientificamerican.com/article/a-century-of-hair-clippings-show-lead-exposure-rates-have-plummeted/?utm_source=lead-update.cgdev.org [LID 29369]

United States, Greater Salt Lake City, Utah, with archived hair samples sourced from family scrapbooks spanning 1916 to 2024. Regional in immediate scope, with global methodological implications for historical biomonitoring where contemporaneous blood lead measurements do not exist. Bartels's Scientific American piece reports work led by Diego Fernandez at the University of Utah analysing 47 archived hair samples by geochemical analysis. Lead concentrations in hair followed the now-familiar industrial trajectory: rising through the early twentieth century, peaking in the 1960s, then declining by more than 100-fold to 2020 to 2024 levels (the 1960s peak ran roughly

120 times current values). The decline aligned with the founding of the US Environmental Protection Agency (1970), the Clean Air Act, the Clean Water Act, the closure of two regional smelters, and the phase-out of leaded petrol. The article does not report blood lead levels (BLLs were not part of the assay; hair is a non-invasive proxy), and does not quote exact ppm or ng/g hair lead values: the visual chart in the article provides the trajectory rather than numerical concentrations. The method does not separate exogenous deposition on the cuticle from endogenous incorporation into the shaft, a recognised limitation. Sources of lead implied or named: leaded petrol exhaust, smelter emissions from the Utah Pb-Zn industry, and ambient air and water contamination prior to the 1970s regulatory regime.

2026 Volcano Art Prize
Kevina Malhotra: *Lead Bioindicators:* Lead-Safety Message: Both hummingbird feathers and seahorses are good lead bioindicators because both live in limited moving ranges and bioaccumulate local lead pollution. **Description of Work:** Coloured pencils on paper combined digitally through Paint and PowerPoint. https://volcanoartprize.com/portfolio-item/lead-bioindicators/ [LID 29410]

Assessing Lead Exposure Risks from Commonly Used Consumer Products in Malawi

Lead Research for Action. February 2026, https://www.leadresearch.org/post/assessing-lead-exposure-risks-from-commonly-used-consumer-products-in-malawi?utm_source=lead-update.cgdev.org [LID 29370]

Malawi, with sampling across 24 markets in three districts. National in scale, with implications for the broader sub-Saharan African consumer-product lead literature and the IHME-Lead Research for Action (LeRA) collaboration's market-screening protocol. Lead Research for Action's Malawi report screened 747 consumer products across 12 categories (metallic cookware, plastic foodware, geophagic substances, dried leafy greens, and others) by X-ray fluorescence (XRF) and confirmatory laboratory analysis. More than half of metallic cookware samples exceeded 100 ppm lead; some plastic foodware items exceeded 1,000 ppm, with substantial variation by colour and brand; geophagic materials (clay-based substances eaten especially during pregnancy) "greatly exceed maximum acceptable levels" for directly ingested products. Biokinetic modelling translated geophagic clay consumption during pregnancy into "potentially large associated increases" in maternal and foetal blood lead levels; no direct BLL measurements were taken in this study (specific µg/dL projections were not extracted from the publicly visible summary). The report concludes that multiple everyday product categories are likely significant lead exposure sources in Malawi and recommends targeted regulatory action and follow-up biomonitoring. Sources of lead named: lead-soldered or scrap-input metallic cookware (informal and formal production), lead pigments in coloured plastic foodware, contaminated geophagic clays, and contaminated dried leafy greens, with brand-level findings deferred to the follow-up brief (LID 29378).

Netflix's 'answer to Chernobyl' tells harrowing story of lead poisoning

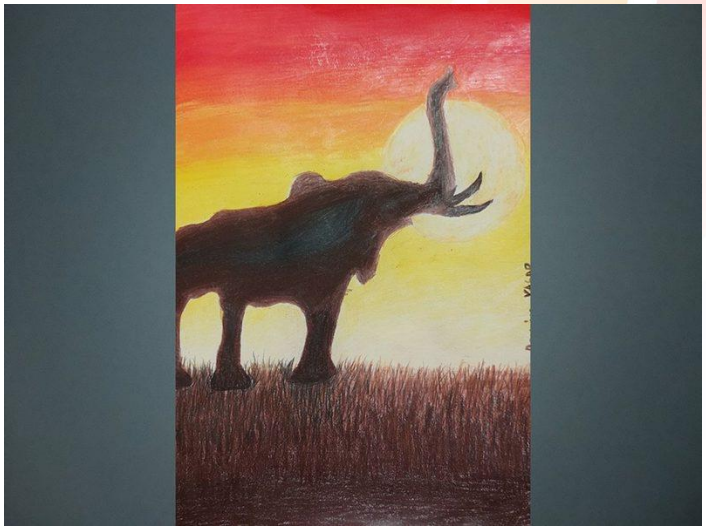
Metro. February 2026, https://metro.co.uk/2026/02/12/netflixs-answer-chernobyl-tells-harrowing-story-children-suffering-lead-poisoning-26851188/?utm_source=lead-update.cgdev.org [LID 29371]

Poland, 1970s setting (Silesia, near a state-owned lead smelter), dramatised in the Netflix six-part series Lead Children. National in immediate scope, but with global cultural reach via streaming and explicit comparisons to HBO's Chernobyl and Netflix's Toxic Town (the Corby UK lead-and-cadmium-in-reclamation case). Metro's review piece (Milo Pope) covers the show's reception, plot, and historical underpinnings. The series dramatises the real-life campaign of Dr Jolanta Wadowska-Król, who in the 1970s identified and pursued the link between a nearby state smelter and mass lead poisoning of children, against active suppression by the communist Polish government and Soviet-aligned institutional pressure. Her advocacy eventually forced the demolition of housing closest to the plant and the chelation and clinical management of large numbers of affected children. The article does not quote specific blood lead level concentrations or paediatric case counts; the show, drawn from Wadowska-Król's testimony and Michal Jedryka's book Lead Children, depicts BLLs and clinical signs without numerical anchors in this review. Source of lead: smelter emissions from a state-owned non-ferrous works (the Szopienice lead smelter in the Katowice district is the real-world referent, though not named in this review). The framing positions the production as a cultural lead-poisoning awareness moment akin to the Chernobyl miniseries.

How to stop the flow of lead in new and existing drinking water systems

JH Redmon. PLOS Water. February 2026, https://journals.plos.org/water/article?id=10.1371%2Fjournal.pwat.0000497&utm_source=lead-update.cgdev.org [LID 29372]

Global, with case material drawn from the United States (North Carolina childcare facilities), Central America (largest-city distribution sample), and sub-Saharan Africa (rural handpump studies). Global in scale, framed for the PLOS Water audience as a unified prevention-plus-remediation agenda spanning high- and low-income contexts. Redmon's PLOS Water opinion piece argues that lead contamination of drinking water is neither solved in wealthy countries nor confined to a residual fringe in LMICs, but is a global continuing problem with shared infrastructural drivers. Cited prevalence figures include approximately 25% of global samples exceeding the WHO provisional guideline of 10 µg/L, 12% of North Carolina childcare facility samples exceeding that threshold, and 8.9% of first-draw samples in a Central American capital city above guideline. African handpump component testing found 51% of foot valves and 45% of tap spouts containing lead above the US Reduction of Lead in Drinking Water Act 0.25% threshold. The piece restates that WHO attributed nearly half of the two million chemical-exposure deaths in 2019 to lead, with more than 30% of childhood developmental disability linked to lead. No new blood lead level distributions are reported. Sources of lead named: lead service lines, leaded brass and bronze plumbing fittings, lead-containing solder, and lead-bearing pump components (foot valves, tap spouts) in rural community supplies. The recommended dual strategy: keep new lead components out of new systems and find-and-fix existing in-place lead.



2026 Volcano Art Prize
Devrim Yasar (age 11, Creative Einstein): *Elephants, Droughts and Lead:* Lead-Safety Message: During droughts, shrinking water holes can concentrate heavy metals like lead. As water levels fall, elephants are forced to consume sediment, mud, and water with high concentrations of contaminants. **Description of Work:** Coloured pencil drawing with digital side panels created in Paint and PowerPoint. https://volcanoartprize.com/portfolio-item/elephants-droughts-and-lead/ [LID 29363]

Housing age and sociodemographic characteristics as predictors of residential lead exposure and modeled child blood lead levels

Alde et al. Science of the Total Environment. February 2026, https://www.sciencedirect.com/science/article/pii/S0048969726001750?utm_source=lead-update.cgdev.org [LID 29373]

United States, comparing two states with contrasting housing stocks and water-supply regimes: Indiana and North Carolina. Multi-state in immediate scope, with national implications for equity-focused lead-risk modelling and for the CDC and EPA's transition from blanket screening to risk-targeted screening. Alde and colleagues sampled residential lead in soil, dust, and drinking water across Indiana and North Carolina households and modelled child blood lead levels (BLLs) using IEUBK or similar biokinetic frameworks. Housing age was the consistent dominant predictor across both states, with newer homes associated with significantly lower lead in all three environmental media and lower modelled child BLL; the strength of the housing-age association was greater in North Carolina than in Indiana. Sociodemographic predictors diverged: in Indiana, percentage of Black residents was associated with higher water lead, while in North Carolina poverty level and water-source type were the stronger water-lead predictors. Private well use was associated with 4.4 times higher water lead than municipal supply. The publicly visible summary does not report numerical µg/dL modelled BLL distributions; the ScienceDirect full text was bot-blocked in this pass. Sources of lead named: deteriorated lead paint and dust in older housing, lead-bearing private well systems and household plumbing, and soil contamination from legacy paint and historical industrial deposition. The authors call for locally calibrated, equity-aware lead-risk targeting.

Association between potential lead exposure assessed using a screening questionnaire and aggressive behaviour among adolescents in Jakarta, Indonesia: a cross-sectional study

Suraya et al. BMJ Public Health. February 2026, https://bmjpublichealth.bmj.com/content/4/1/e003239?utm_source=lead-update.cgdev.org [LID 29374]

Indonesia, with field work in Jakarta. National in immediate scope, with implications for LMIC

adolescent lead exposure surveillance where direct blood lead measurement at population scale is logistically infeasible. Suraya and colleagues sampled middle and high school students aged 13 to 18 in Jakarta, indexing exposure with the Indonesian Ministry of Health's lead exposure risk questionnaire and aggression with a validated behavioural inventory. The article fills a recognised LMIC evidence gap noted in LID 29349 (Obamuyide systematic review): non-blood-based exposure proxies coupled with adolescent aggression outcomes. The publicly visible material confirms the cross-sectional design, the Jakarta school-based sample, and the use of the Ministry questionnaire (which surveys living environment, water source, paint condition, household trades, cosmetics, traditional remedies, and exposure to motor vehicle and battery work), but specific sample size, odds ratios, and confidence intervals were not extractable; the BMJ Public Health full text was bot-blocked in this pass. No blood lead levels are measured in the study by design. Sources of lead implied by the questionnaire instrument: deteriorated lead-based paint, lead-contaminated water and soil, parental occupational exposure (battery recycling, auto painting, soldering), lead-containing cosmetics and traditional remedies. The work is positioned as a low-cost screening tool for jurisdictions lacking biomonitoring capacity.

Lead-Safe Off-Grid Electrification: Understanding the Issues in Sub-Saharan Africa

Rachel Bonnifield and Caroline Mallory. Center for Global Development. February 2026, https://www.cgdev.org/publication/lead-safe-off-grid-electrification-understanding-issues-sub-saharan-africa?utm_source=lead-update.cgdev.org [LID 29375]

Sub-Saharan Africa, with focus on rural, remote, and conflict-affected areas where grid electrification remains absent. Regional in scale, with global development-policy implications because off-grid solar electrification is a flagship Sustainable Development Goal 7 strategy and a major Bank-, donor-, and impact-investor-financed sector. Bonnifield and Mallory at CGD interrogate the lead-poisoning externality of off-grid solar: 677 million people lacked electricity in 2023, roughly 87% of them in sub-Saharan Africa, and the off-grid solar sector that has been the principal expansion mechanism relies almost entirely on lead-acid battery storage. The authors estimate that off-grid solar generates 250,000 to 1.5 million tonnes of used lead-acid battery (ULAB) waste annually, equating to 13% to 47% of the region's total ULAB waste stream. Where this material enters informal smelting and breaking yards, the recycling pathway produces severe environmental contamination and direct community exposure. The publication does not report new blood lead level concentrations: it sits in the policy and burden-quantification space rather than biomonitoring. The piece argues for integrating lead-safe end-of-life battery collection and certified recycling into off-grid electrification financing, procurement, and policy from project inception. Source of lead: lead-acid batteries deployed in solar home systems and mini-grids, downstream into largely informal ULAB collection and smelting in West, East, and Southern African urban peripheries.

2025 in Review: Advancing Lead Elimination at Scale

Lead Exposure Elimination Project. February 2026, https://leadelimination.org/2025-in-review/?utm_source=lead-update.cgdev.org [LID 29476]

Global, with field programmes across 40 countries representing roughly 76% of births in low- and middle-income countries (LMICs); explicit case material from Pakistan, Ghana, Liberia, Burundi, Niger, Peru, and Sierra Leone. Global in scale, framed for the donor and Partnership for a Lead-Free Future audience as the year-in-review for the Lead Exposure Elimination Project (LEEP). LEEP's report restates the headline figure that approximately one in three children globally has elevated blood lead and estimates that 97.8 million children could be protected from lead paint exposure across 35

years through programmes initiated in 2025. Operational metrics: 13 paint studies completed in 2025; new lead paint regulations adopted in five countries (Burundi, Liberia, Niger, Peru, Sierra Leone); manufacturers representing more than 80% of the lead paint market across 22 countries engaged; warnings issued to more than 50% of the lead paint market in Ghana and Liberia. The most striking trend data are from Pakistan: oil-based lead paint market share fell from 88% in 2021 to 41% in 2024, with an estimated 7.5 million children protected from paint-mediated exposure. The 2026 targets are 50 countries, regulation in 14 total countries, and 50% reduction in lead adulteration of turmeric in two provinces or states. No new blood lead level data are reported. Sources of lead targeted: lead paint, turmeric and other adulterated spices, traditional eyeliners (kohl and surma documented up to 80% lead by weight), and lead-pigmented plastic foodware.

Schoolchildren's exposure to potentially toxic metals/metalloids and cognitive impairments in communities of the Brazilian Amazon new agricultural frontiers

Menezes-Filho et al. Neurotoxicology. March 2026, https://www.sciencedirect.com/science/article/abs/pii/S0161813X26000252?utm_source=lead-update.cgdev.org [LID 29377]

Brazil, Santarém plateau, State of Pará, in the Amazon's new agricultural frontiers. Local in scale, with regional implications for soybean-expansion zones across Amazonia and global relevance for children living near intensive agriculture on naturally metal-rich soils. Menezes-Filho and colleagues recruited 69 children aged 6 to 12 years across six communities during the 2024 rainy-season soybean planting period, measuring blood and urinary metals/metalloids by inductively coupled plasma mass spectrometry and administering the Raven Coloured Progressive Matrices, NEPSY-II, and Five Digit Test (FDT). Median blood lead level was 1.9 µg/dL (range 0.6 to 40.1 µg/dL), with 14.3% of children above the CDC 3.5 µg/dL blood lead reference value. Blood lead was inversely associated with Raven raw scores and with the verbal domain of NEPSY-II; mercury was also negatively associated with cognitive performance. The authors attribute lead exposure principally to consumption of foods cultivated in naturally Pb-rich Amazonian soils, and mercury exposure to a fish-rich diet, framing both as cognitive risks for children in agricultural-frontier communities.

Lead Exposure Risks from Consumer Products in Malawi: Key Recommendations and Next Steps

Tammy Tan and Isabel Arjmand. Lead for Research Action. March 2026, https://www.leadresearch.org/post/lead-exposure-risks-from-consumer-products-in-malawi-key-recommendations-and-next-steps?utm_source=lead-update.cgdev.org [LID 29378]

Malawi, with field photographs from Salima District markets. National in scale, designed as a tractable policy companion to LeRA's 2025 Malawi lead content study (LID 29370), with regional relevance to sub-Saharan Africa. Tan and Arjmand set out source-by-source recommendations for the four product categories identified as highest priority: geophagic pregnancy soils (GPS), plastic foodware, metallic cookware, and staple/other foods. Key concentrations: GPS mean 48 ppm Pb (median 47, range 9 to 66); plastic foodware mean 442 ppm (median 14, range below LOD to 7,100 ppm), with green and orange plastics highest (means 955 and 736 ppm); one hair dye at 14,000 ppm; one nonstick cookware item above 300,000 ppm. Modelled BLL impacts: GPS consumption of 16 g/day at 48 ppm projects a maternal BLL increase of about 5.21 µg/dL over pregnancy, with foetal BLL 3.65 to 4.69 µg/dL; staple-food contamination projects BLL rises of roughly 0.5 to 5 µg/dL. Recommendations: adopt the EU 100 ppm interim limit for plastic foodware, the UN FAO 100 ppm interim limit for cookware, ban lead acetate in hair dyes, ban imports of contaminated nonstick

cookware, set ceramic leachability limits, and run a Q2/Q3 2026 BLL study on geophagic pregnant women. Sources of lead named: GPS, lead-pigmented plastic foodware (additives), formal and informal metallic cookware (scrap inputs, solder, coatings), contaminated leafy greens and staple foods, leaded hair dye, and ceramic glazes.

An Analytical Study of Lead Levels in Jewellery, Cosmetics & Toys for Children in Bangladesh

Hossain et al. Preventive Medicine Research & Reviews. March 2026, https://journals.lww.com/pmrr/fulltext/9900/an_analytical_study_of_lead_levels_in_jewellery,.156.aspx [LID 29379]

Bangladesh, with sampling concentrated in major markets of Dhaka city. National in scale, with regional implications for South Asian consumer-product surveillance and global relevance for the Lead Paint Alliance's Model Law agenda on lead in toys, jewellery, and cosmetics. Hossain and colleagues (Environment and Social Development Organisation, ESDO; Bangladesh Medical University, Department of Public Health and Informatics) purposively sampled 250 children's products and screened them by portable X-ray fluorescence (XRF). Lead was detected in 62.8% of samples, with 58.6% exceeding the 90 ppm safety threshold used as the international reference for paints and surface coatings. By category, toys accounted for 82.8% of the lead-contaminated items, cosmetics 12.1%, and jewellery 5.1%; plastic materials carried 80.9% of the contamination. Related ESDO XRF work (Hossain as senior technical adviser) has previously reported maximum readings around 2,350 ppm Pb in hard plastic toys from Chawkbazar, well above the 90 ppm limit, alongside coincident chromium, mercury, and cadmium exceedances. No blood lead levels were measured; the design is a market-survey screen rather than a biomonitoring study. The authors call for stricter import controls, enforcement of the existing 90 ppm threshold, and consumer-awareness measures. Sources of lead named: lead-pigmented plastic toys (the dominant pathway), lead-bearing pigments in skin-lightening creams and other cosmetics, and lead in cheap children's jewellery.

The Longer Reach of Lead: Early Childhood Lead Exposure and Cognitive Ability Later-in-Life

Chin et al. Preprint. March 2026, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6300273&utm_source=lead-update.cgdev.org [LID 29380]

United States, drawing on the nationally representative Health and Retirement Study (HRS) administered through the University of Michigan's Institute for Social Research. National in scale, with global relevance for any country still working through the long tail of leaded-gasoline cohorts and for the economic accounting of childhood lead exposure. Zahran, Chin, Keyes, and Mushinski (the SSRN abstract_id 6300273 March 2026 revision of working paper 5220896) link geo-referenced HRS respondents (n in the hundreds of thousands) to state-year estimates of tetraethyl-lead emissions from leaded gasoline during their early childhood, exploiting the post-1970s phase-down as a natural experiment. They find consistent later-in-life impairment on standardised cognitive and memory measures attributable to early childhood lead exposure, with effects that worsen with age and amplify with household poverty (an interaction the authors flag as central to lifetime-cost estimates). Companion findings from the team's parallel work estimate that policy-driven cuts in childhood lead exposure improved standardised test scores by 0.13 to 0.17 standard deviations, with a dose-response shape uniform across the performance distribution; press coverage of the broader programme cites roughly 170 million Americans exposed in early childhood to lead levels at least five times current

safety thresholds. No new blood lead level values are reported in this paper: exposure is reconstructed from gasoline-emissions records rather than measured BLLs. Source of lead named: tetraethyl-lead emissions from leaded gasoline, concentrated in dense-traffic and industrial zones during the 1960s and 1970s.

2021 Volcano Art Prize
Gary Keller: *Where toddlers go to cut their teeth on lead:* Lead-Safety Message: Where toddlers go to cut their teeth on lead: a warning about lead-painted surfaces accessible to crawling and teething children. **Description of Work:** Photos made into a poster. https://volcanoartprize.com/portfolio-item/where-toddlers-go-to-cut-their-teeth-on-lead/ [LID 27732]

Blood lead levels in children and soil lead contamination in a former mining area in Germany

John et al. Environmental Epidemiology. April 2026, https://journals.lww.com/environepidem/fulltext/2026/04000/blood_lead_levels_in_children_and_soil_lead.5.aspx?utm_source=lead-update.cgdev.org [LID 29381]

Germany, in the former mining district of Goslar (Lower Saxony), with sampling in the Oker and Harlingerode neighbourhoods where commercial mining ceased in 1988. Local and national in scale, with global relevance for any legacy mining or smelter community managing persistent soil-lead burdens. John and colleagues conducted a cross-sectional study in 2023/24 measuring blood lead levels (BLLs) in 310 children aged 5 to 7, paired with detailed soil-lead mapping and guardian-reported exposure pathways (hand-to-mouth contact, handwashing, homegrown and foraged food, outdoor play, secondhand smoke). The geometric mean BLL was 22.7 µg/L (i.e. 2.27 µg/dL); 51% of children exceeded the German Human Biomonitoring reference values of 19/22 µg/L (i.e. 1.9 µg/dL for girls and 2.2 µg/dL for boys – *Ed. Note: these are the lowest child blood lead reference values or "blood lead action levels" in the world*), 24% exceeded the US reference of 35 µg/L (3.5 µg/dL), and 13% exceeded the WHO 50 µg/L (5 µg/dL) benchmark. Residential soil lead concentrations reached medians of around 1,500 mg/kg, classified into low (below 200), moderate (200 to 400), high (400 to 1,000), and very high (above 1,000) mg/kg strata. Children in the most contaminated strata had BLLs 29% higher than those in the least contaminated. Soil contamination emerged as the dominant exposure pathway. The authors call for continued and strengthened preventive measures (hand hygiene, soil cover, dietary advice on homegrown produce) in former mining regions. Sources of lead named: legacy mining and smelter contamination of residential soils, with secondary contributions from homegrown produce, hand-to-mouth soil ingestion, and (minor) secondhand cigarette smoke.

Effectiveness of soil remediation intervention of abandoned used lead-acid battery recycling sites to reduce lead exposure among children: A three-arm pretest-posttest non-equivalent comparison group trial

Rahman et al. International Journal of Hygiene and Environmental Health. April 2026, https://www.sciencedirect.com/science/article/pii/S1438463926000167?utm_source=lead-update.cgdev.org [LID 29382]

Bangladesh, Mirzapur (Tangail District), centred on two abandoned used lead-acid battery (ULAB) recycling sites that ceased operating in early 2019. Local in scale, with national and global implications for ULAB-contaminated communities across South Asia and sub-Saharan Africa, and operationally relevant to Pure Earth and World Bank PRTR (Pollutant Release and Transfer Register) remediation programmes. Rahman and colleagues ran a three-arm pretest-posttest non-equivalent comparison-group trial: a soil-remediation intervention site, a ULAB control site (no remediation), and a non-ULAB control community, following 167 children aged 6 months to 12 years with blood lead measurements at baseline and 12 months. Mean BLLs at baseline and follow-up were 9.01 then 7.04 µg/dL in the intervention arm, 8.85 then 8.11 µg/dL in the ULAB control arm, and 4.28 then 3.78 µg/dL in the non-ULAB control arm. Difference-in-differences analysis showed a 15% greater BLL decline in the intervention arm versus the ULAB control and 11% greater versus the non-ULAB control. Older children (above 5 years), those within 200 m of the site, and those with above-median baseline BLLs gained the most. Crucially, post-intervention BLLs in the active arm remained above the CDC reference value of 35 µg/L (3.5 µg/dL), indicating that site remediation alone is necessary but not sufficient. Pathways: soil and household dust contaminated by informal ULAB smelting and acid drainage at the abandoned recycling sites, with exposure increasing with proximity to site.

Circulating miR-126 and miR-155 are associated with environmental lead exposure: A translational approach via human biomonitoring and bioinformatic networks

González-Bravo et al. Toxicology Reports. June 2026, https://www.sciencedirect.com/science/article/pii/S2214750026000120?via%3Dihub [LID 29383]

Mexico, in the Ejido "Las Palmas" community of Tamuín municipality, San Luis Potosí, a region with a long history of mining and metallurgical activity. Local in scale, with national implications for Mexican biomonitoring (NOM-199-SSA1-2000) and global relevance to the mechanistic literature linking low-to-moderate lead exposure to cardiovascular and inflammatory disease. González-Bravo and colleagues take a translational, cross-sectional approach: they measure blood lead levels (BLLs) and quantify two circulating microRNAs, miR-126 and miR-155. Mean BLL was 7.6 ± 5.8 µg/dL, with more than 50% of participants exceeding Mexico's reference threshold of 5 µg/dL. Both miRNAs showed significantly altered expression ($p < 0.05$) in association with elevated BLLs. Pathway enrichment pointed to inflammation, angiogenesis, lipid metabolism, and atherosclerosis-related processes, with myelocytomatosis (MYC) implicated as a regulatory node affecting cardiovascular function. The authors are explicit that the observational design precludes causal inference and call for larger epidemiological cohorts. Source of lead: environmental exposure characterised at the community level (the abstract does not pin down specific industrial sources, though San Luis Potosí is a long-established mining and smelting region of Mexico, with that contextual attribution implied).

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