

LEAD: THE LATEST FEDERAL ACTIONS AND BEST PRACTICES

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I. BACKGROUND – THE LEAD STORY

Lead has an old and even ancient legacy of harm to humans.¹ Despite this history, lead was widely used in the development of consumer goods used for and around children in the United States during the industrial era.² The decision to use it in two widely distributed commercial products created a public health nightmare. Leaded gasoline and leaded paint robbed countless children and adults of opportunities for greater economic prosperity, educational achievement, and deeper social engagement.³ Moreover, death and disease have been visited upon millions of unsuspecting families and individuals around the world because of their exposure to lead.⁴ In the United States alone, deaths attributable to lead exposure have been estimated at over four hundred thousand.⁵ At the global level, the World Health Organization has made the following determinations:

Lead exposure can have serious consequences for the health of children. At high levels of exposure to lead the brain and central nervous system can be severely damaged, which could result in a coma, convulsions, and even death. Children who survive severe lead poisoning may be left with permanent intellectual disability and behavioral disorders. At lower levels of exposure that cause no obvious symptoms, lead is now known to produce a spectrum of injury across multiple body systems. In particular, lead can affect children's brain development, resulting in reduced intelligence quotient (IQ), behavioral changes such as reduced

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1. Milton A. Lessler, *Lead and Lead Poisoning from Antiquity to Modern Times*, 88 OHIO J. SCI. 78, 79 (1988). (“Among the earliest records, whether on papyrus, copper, parchment or cuneiform writing on clay, there are notes that lead miners and individuals who worked with lead developed ailments that resulted in their early demise. This was first well documented by the Egyptians who used slaves in their mines and later by the PreGreeks, Greeks, and Romans.”)

2. Richard Rabin, *Warnings Unheeded: A History of Child Lead Poisoning*, 79 AM. J. PUB. HEALTH 1668, 1672-73 (1989).

3. Timothy Dignam et al., *Control of Lead Sources in the United States, 1970-2017: Public Health Progress and Current Challenges to Eliminating Lead Exposure*, 25 J. PUB. HEALTH MGMT. & PRAC. 1, 3-4 (2019) (author manuscript) (on file at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6522252/> [<https://perma.cc/P7YT-JT9R>]).

4. Dylan Matthews, *Lead Poisoning Could Be Killing More People Than HIV, Malaria, and Car Accidents Combined*, VOX (Sept. 14, 2023), [https://www.vox.com/future-perfect/2023/9/14/23868347/lead-poisoning-death-toll-world-bank-pure-earth#:~:text=These%20are%20massive%20numbers%2C%20and,%20malaria%20\(643%2C381\)%20combined](https://www.vox.com/future-perfect/2023/9/14/23868347/lead-poisoning-death-toll-world-bank-pure-earth#:~:text=These%20are%20massive%20numbers%2C%20and,%20malaria%20(643%2C381)%20combined) [<https://perma.cc/59CH-SGP8>].

5. Bruce P. Lanphear et al., *Low-level Lead Exposure and Mortality in US Adults: A Population-based Cohort Study*, 3 LANCET PUB. HEALTH 177, 182 (2018).

attention span and increased antisocial behavior, and reduced educational attainment. Lead exposure also causes anemia, hypertension, renal impairment, immunotoxicity, and toxicity to the reproductive organs. The neurological and behavioral effects of lead are believed to be irreversible.

There is no known safe blood lead concentration; even blood lead concentrations as low as 3.5 µg/dL may be associated with decreased intelligence in children, behavioral difficulties and learning problems.⁶

The World Health Organization's 2021 update of *The Public Health Impact of Chemicals: Knowns and Unknowns* estimated that nearly half of the two million lives lost to known chemicals exposure in 2019 were due to exposure to lead.⁷ Lead exposure is estimated to account for 21.7 million years lost to disability and death (disability-adjusted life years, or DALYs) worldwide due to long-term effects on health, including 30% of the global burden of idiopathic intellectual disability, 4.6% of the global burden of cardiovascular disease and 3% of the global burden of chronic kidney diseases.⁸

The harm that lead exposure causes to humans was suspected in the ancient world and has been well documented since the early to mid-twentieth century based on occupational and childhood exposures.⁹ Although naturally occurring, lead poses substantial health risk when introduced into the human body.¹⁰ The exposure pathways that lead to lead poisoning follow two primary routes—ingestion and inhalation.¹¹ Adults working with lead in the lead mining, smelting, and other industries were historically exposed through dermal absorption as well.¹² Children exposed to lead through the years have been exposed throughout their environments.¹³ Inside homes, in yards and playgrounds, in schools, daycare centers, and nurseries, children have been and continue to be exposed through inhalation and ingestion of lead dust and lead paint, as well as lead in water, food, and toys.¹⁴

The Flint Water Crisis provided the country with a clear example of the

6. *Lead Poisoning*, WORLD HEALTH ORGANIZATION (Aug. 11, 2023), <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health> [<https://perma.cc/2C5U-F26J>].

7. *The Public Health Impact of Chemicals: Knowns and Unknowns*, WORLD HEALTH ORG. (May 23, 2016), <https://www.who.int/publications/i/item/WHO-FWC-PHE-EPE-16-01> [<https://perma.cc/P9QV-MUKQ>].

8. *Lead Poisoning*, WORLD HEALTH ORG. (Aug. 11, 2023), <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health> [<https://perma.cc/62WS-ZKKW>].

9. HERBERT L. NEEDLEMAN, HISTORY OF LEAD POISONING IN THE WORLD 1-4 (1999), https://www.biologicaldiversity.org/campaigns/get_the_lead_out/pdfs/health/Needleman_1999.pdf [<https://perma.cc/NEF4-RSE9>].

10. *See generally* U.S. DEP'T OF HEALTH & HUM. SER., TOXICOLOGICAL PROFILE FOR LEAD vi (Aug. 2020), <https://www.atsdr.cdc.gov/toxprofiles/tp13.pdf> [<https://perma.cc/JP2B-7YY>].

11. *Id.* at 12.

12. *Id.*

13. Rabin, *supra* note 2, at 1669 (as early as 1924 it was recognized that, “[a] child lives in a lead world”).

14. Dignam et al., *supra* note 3, at 3-8.

continuing harm that lead inflicts upon America's children and its race and class dimensions.¹⁵ While lead poses an equal threat to all children poisoned by it, children are not equally exposed to lead.¹⁶ In its 1992 report, *Reducing Risk to All Communities*, the U.S. Environmental Protection Agency (EPA) recognized that lead was unique in the level of scientific data available regarding childhood lead exposure and the blood lead elevation that results from it.¹⁷

There are clear and dramatic disparities among ethnic groups for death rates, life expectancy, and disease rates. There is also a surprising lack of data on human exposures to environmental pollutants for Whites as well as for ethnic and racial minorities. One exception is lead exposures in children, and there the data are unequivocal: Black children have disproportionately higher blood lead levels than White children even when socioeconomic variables are factored in.¹⁸

The disparities in elevated blood lead levels the agency found in 1992 persist today.¹⁹ Lead remains one of the nation's most stark and persistent examples of environmental injustice. Race and socioeconomic status together and independently represent the best predictors of elevated blood lead levels in children.²⁰ As the Flint Water Crisis demonstrated, environmental justice alludes communities vulnerable to governmental indifference and neglect. Through both foreseeable and unintended outcomes of corporate and government actions, countless children have suffered death and long-term harm from lead exposure.²¹

Scholars and advocates continue to sound the alarm by calling for greater governmental action to remove lead from the places where it threatens children.²² As a matter of public health, environmental protection, and

15. See Hope Kerpelman, *Let Them Eat Paint: Childhood Lead Paint Poisoning as the Denial of Constitutional and Civil Rights*, 51.2 COLUM. HUM. RTS. L. REV. 828, 828 (2020).

16. *Id.* at 843-48.

17. U.S. ENV'T PROT. AGENCY, ENVIRONMENTAL EQUITY REDUCING RISK FOR ALL COMMUNITIES 1, 15 (June 1992), https://www.epa.gov/sites/default/files/2015-02/documents/reducing_risk_com_vol1.pdf [<https://perma.cc/S6WP-WTVX>].

18. *Id.*

19. Andrea E. Cassidy-Bushrow et al., *Burden of Higher Lead Exposure in African-Americans Starts in Utero and Persists into Childhood*, 108 ENV'T INT'L 221, 221-27 (Nov. 2017).

20. See Kerpelman, *supra* note 15, at 843.

21. Kerpelman, *supra* note 15, at 840-41; see also Howard Mielke & Sara Egendorf, *Getting the Lead Out: A Career-Long Perspective on Leaded Gasoline, Dust, Soil, and Proactive Pediatric Exposure Prevention*, 11 MED. RSCH. ARCHIVES 1, 2-4 (May 26, 2023); see generally Rabin, *supra* note 2, at 1668-1674.

22. See Emily A. Benfer, *Contaminated Childhood: How the United States Failed To Prevent the Chronic Lead Poisoning of Low-Income Children and Communities of Color*, 41 HARV. ENV'T L. REV. 493, 493 (2017); Emily A. Benfer et al., *Health Justice Strategies to Eradicate Lead Poisoning: An Urgent Call to Action to Safeguard Future Generations*, 19 YALE J. HEALTH POL'Y L. & ETHICS 122, 146 (2020) [hereinafter *Health Justice Strategies*]; Emily A. Benfer et al., *Duty to Protect: Enhancing the Federal Framework to Prevent Childhood Lead Poisoning and Exposure to Environmental Harm*, 18 YALE J. HEALTH POL'Y L. & ETHICS 1, 27-37 (2019)

environmental justice, legal scholarship has astutely called for more protection for children from lead exposures.²³ While many articles speak to the problem of lead generally or to more specific concerns such as lead based paint exposures or varied aspects of the Flint Crisis, more attention to the specific law and policy interventions needed to reduce lead exposure for the nation's children is needed.²⁴ Those that do, focus on federal action—providing critical guidance to the executive branch on eliminating lead exposures from the lives of children.²⁵ Yet, in the environmental arena protection of public and health and welfare depend on federal, state, and local government actors coordinated efforts.²⁶

This Article responds to the existing literature calling for governmental action and legal reform by identifying some significant developments at both the federal and state level in lead protection and their importance. Part II of this Article examines the Centers for Disease Control (CDC) revised blood lead reference value issued in 2021 and EPA's 2022 Final Strategy to Reduce Lead Exposures and Disparities in U.S. Communities.²⁷ In Part III, this Article addresses the under examined role of state law in securing health protection for children and pregnant women. The state law analysis draws on the preliminary findings of a nationwide state lead protection program review conducted by the Howard University School of Law Environmental and Climate Justice Center and the 2017 *Children at Risk: Gaps in State Lead Screening Policies* Report by Jennifer Dickman and Safer Chemicals Healthy Families.²⁸ Best state practices for primary prevention are highlighted in this section. Part IV offers conclusions and next steps.

[hereinafter *Duty to Protect*] (proposing explicit EPA actions to remove lead from air, water, and soil).

23. See Montrece McNeill Ransom et al., *Toward Eradication: How Law and Public Health Practices can be used to prevent Childhood Lead Poisoning*, 22 TUL. ENV'T. L. J. 1, 4 (2008); see also Benfer, *supra* note 22, at 493; *Health Justice Strategies*, *supra* note 22, at 146; Kerpelman, *supra* note 15, at 840-41.

24. *Duty to Protect*, *supra* note 22, at 27-37 (providing an exemplary in-depth analysis of interventions necessary to make meaningful progress on reducing lead exposure through primary prevention); see generally Brie D. Sherman, *Pride and Prejudice and Administrative Zombies: How Economic Woes, Outdated Environmental Regulations, and State Exceptionalism Failed Flint, Michigan*, 88 U. Colo. L. Rev. 653 (2017) (exploring the origins of the Flint Water Crisis); see also *Health Justice Strategies*, *supra* note 22, at 146-60.

25. *Duty to Protect*, *supra* note 22, at 27-37; see also *Health Justice Strategies*, *supra* note 22, at 146-160.

26. See generally Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141 (1995).

27. See *infra*, Part II B.

28. JENNIFER DICKMAN & SAFER CHEM. HEALTHY FAM., CHILDREN AT RISK: GAPS IN STATE LEAD SCREENING POLICIES 1 (Jan. 2017), https://toxicfreefuture.org/wp-content/uploads/2017/01/saferchemicals.org_children-at-risk-report.pdf [<https://perma.cc/4BJE-3SHF>].

II. CDC AND EPA ADVANCE

A. *CDC Acts*

The CDC provides national leadership on lead protection standards, especially for children.²⁹ In its role as the nation's "leading science-based, data-driven, service organization that protects the public's health," CDC's efforts under its Childhood Lead Poisoning Prevention Program date back over half a century.³⁰ Its most recent approach to establish lead protection standards for children can be traced back to November 10, 2010 when the CDC Advisory Committee for Childhood Lead Poisoning Prevention (ACCLPP) established the Blood Lead Level (BLL) workgroup.³¹ On January 4, 2012, the ACCLPP approved the work group's report that called for new approaches and commitments by the CDC to protect children from lead exposure.³² The report called for a number of actions by CDC to strengthen and support primary and secondary prevention efforts.³³ The first and most important of which follow below:

I. Recommendation: Based on the scientific evidence, the ACCLPP recommends that the term, "level of concern", be eliminated from all future agency policies, guidance documents, and other CDC publications, and that current recommendations based on the "level of concern" be updated according to the recommendations contained in this report.

...

II. Recommendation: CDC should use a childhood BLL reference value based on the 97.5th percentile of the population BLL in children ages 1-5 (currently 5 µg/dL) to identify children and environments associated with lead-exposure hazards. The reference value should be updated by CDC every four years based on the most recent population-based blood lead surveys among children.³⁴

The first recommendation called for CDC to abandon its prior approach of

29. Ettinger AS, Leonard ML, Mason J. CDC's Lead Poisoning Prevention Program: A Long-standing Responsibility and Commitment to Protect Children from Lead Exposure. *J Public Health Manag Pract.* 2019 Jan/Feb;25 Suppl 1, Lead Poisoning Prevention available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6320665/>; see also CDC Childhood Lead Poisoning and Prevention Program Description available at <https://www.cdc.gov/nceh/lead/about/program.htm>.

30. *1970s - 1980s Timeline*, CTR. FOR DISEASE CONTROL & PREVENTION (last reviewed April 6, 2021), <https://www.cdc.gov/nceh/lead/about/1980s.html#1970s> [<https://perma.cc/5XCZ-LN3G>].

31. CTR. FOR DISEASE CONTROL & PREVENTION, CDC RESPONSE TO ADVISORY COMMITTEE ON CHILDHOOD LEAD POISONING PREVENTION 1 (June 7, 2012), https://www.cdc.gov/nceh/lead/docs/cdc_response_lead_exposure_recs.pdf [<https://perma.cc/2UB9-T7U6>].

32. *Id.* at 2.

33. *Id.* at 2-3.

34. *Id.* at 5-6.

identifying children as having a blood lead “level of concern” when blood lead screening indicated 10 or more micrograms per deciliter ($\mu\text{g}/\text{dL}$) of lead in a child’s blood.³⁵ This approach was rejected by the group “based on the compelling evidence that low BLLs are associated with IQ deficits, attention-related behaviors, and poor academic achievement.”³⁶ Moreover, the ACLPP workgroup pointed to “the absence of an identified BLL without deleterious effects, combined with the evidence that these effects appear to be irreversible. . . .”³⁷ Building on the shift away from the “level of concern approach,” the group called for the creation and use of a blood lead reference value tied to the blood lead levels of the 97.5 percentile of children nationwide.³⁸ Under the old system, parents were not generally informed that their children had blood levels less than 10 $\mu\text{g}/\text{dL}$.³⁹ The new system would mean that parents and healthcare professionals could address elevated blood lead levels through intervention and education. The blood lead level values would be based on data from the blood lead surveys of children around the country collected and updated in association with the National Health and Nutrition Examination Survey (NHANES) every four years.⁴⁰ At the time, the 97.5 percentile of the blood lead level distribution among children between one and five years old was 5 $\mu\text{g}/\text{dL}$.⁴¹ The work group approximated that 450,000 children had blood lead levels above that at the time.⁴² Under the strategy, those children were to be understood as at risk and parents and healthcare professionals would act to address the risk. In 2012, CDC adopted the new approach and 5 $\mu\text{g}/\text{dL}$ as a blood lead reference value.⁴³ In May of 2021, the CDC updated its blood lead reference value to 3.5 $\mu\text{g}/\text{dL}$ based on NHANES data from 2015–2016 and 2017–2018.⁴⁴ This action, by CDC, meaningfully advances lead protection based on growing awareness of the risk that lead exposure poses to children at low levels and the evidence that there is no “safe” level of blood lead in children.⁴⁵ The new blood lead reference value triggers more protective standards across the public health sector. Since its adoption, federal, state, and local governments have adjusted screening levels, practices, and pollution standards.⁴⁶ The next section of this

35. *Id.* at 5-6.

36. *Id.* at 2.

37. *Id.*

38. *Id.*

39. *Id.*

40. *Id.*

41. *Id.*

42. *Id.*

43. *Id.*

44. *Blood Lead Reference Value*, CTR. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm#:~:text=CDC%20uses%20a%20blood%20lead,higher%20than%20most%20children's%20levels> [<https://perma.cc/99EP-6N57>] (Dec. 2, 2022).

45. *Lead Poisoning*, WORLD HEALTH ORG. (Aug. 11, 2023), <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health> [<https://perma.cc/RC2Z-BB47>].

46. Ruckart PZ, Jones RL, Courtney JG, LeBlanc TT, Jackson W, Karwowski MP, Cheng PY, Allwood P, Svendsen ER, Breysse PN. Update of the Blood Lead Reference Value - United

Article focuses on actions taken by EPA, the national leader in setting environmental protection standards for lead and other dangerous contaminants, since 2021.

B. EPA's Lead Strategy

In October 2021, following the May CDC determination, EPA published its draft lead strategy.⁴⁷ It followed the draft with a final strategy in October of 2022.⁴⁸ The final strategy represents the first agency-wide strategy to address the problem of lead.⁴⁹ Through the use of a “whole of EPA approach,” the agency sought to make meaningful progress in reducing both lead exposures and lead related disparities in communities across the nation.⁵⁰ The strategy recognizes that lead exposure and its harm to children and communities are not evenly distributed across the country.⁵¹ Instead, deep disparities exist in children’s protection from lead exposures.⁵² While some commenters thoughtfully focus discussion on disparities at the intersection of race and poverty, parsing out the different sources of lead exposures across communities is also necessary to develop effective public health interventions.⁵³ Children face disparate risk of elevated blood lead levels due to disparate exposure to sources of lead.⁵⁴ Disparities in lead exposure and its harms exist in rural and urban settings, small towns and big cities, and in every region of the country though the sources of lead and means of exposure may differ. Interior lead-based paint and its dust in pre-1978 urban housing accounts for one substantial source of lead across the country.⁵⁵ Some children living in areas near former lead mines, lead smelters, and other toxic waste sites may not face risks from paint

States, 2021. MMWR Morb Mortal Wkly Rep. 2021 Oct 29;70(43):1509-1512 at 1509, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8553025/>.

47. *Final Strategy to Reduce Lead Exposure and Disparities in U.S. Communities*, U.S. ENV'T PROT. AGENCY, <https://www.epa.gov/lead/final-strategy-reduce-lead-exposures-and-disparities-us-communities#:~:text=Under%20this%20strategy%2C%20EPA%20will,social%20and%20economic%20well%2Dbeing> [<https://perma.cc/4VY4-XCNR>] (Feb. 1, 2024) [hereinafter *Final Strategy*].

48. *Id.*

49. *Id.*

50. *Id.*

51. *Id.*

52. See Benfer, *supra* note 22, at 504-05.

53. See *Health Justice Strategies*, *supra* note 22, at 146.

54. See Benfer, *supra* note 22, at 505-08 (discussing the relationship between racial discrimination against African Americans in housing and lead exposure); see Lorraine Halinka Malcoe et al., *Lead Sources, Behaviors, and Socioeconomic Factors in Relation to Blood Lead of Native American and White Children: A Community-Based Assessment of a Former Mining Area*, 110 ENV'T HEALTH PERSP. 221, 227-28 (2002) (discussing lead exposure in Native American and white children living in former mining areas); see Matthew D. Ritchey et al., *Lead poisoning among Burmese refugee children--Indiana, 2009*, 50 CLINICAL PEDIATRICS 648 (Mar. 2011) (providing an example of lead poisoning among children living in an immigrant community in Fort Wayne, Indiana).

55. See Dignam et al., *supra* note 3, at 8.

at all, and still suffer disproportionate lead exposure and harm.⁵⁶ Children in areas with poorly maintained drinking water infrastructure may also be exposed to lead in soils in and around their schools, childcare centers, and homes.⁵⁷ In other cases, children and pregnant persons may face their primary exposure through imported toys,⁵⁸ cosmetic products,⁵⁹ spices,⁶⁰ candy,⁶¹ or other foods.⁶² Race, income levels, and cultural context all play roles in recognizing and addressing lead exposure disparities. African Americans are disproportionately

56. Malcoe et al., *supra* note 56, at 226.

57. See JOHN RUMPLER & MATT CASALE, ENV'T AM. RSCH. & POL'Y CTR, GET THE LEAD OUT 9-11 (Feb. 23, 2023) (discussing exceedances of federal lead drinking water standards in schools across the country); see Michael Wines & John Schwartz, *Unsafe Lead Levels in Tap Water Not Limited to Flint*, N.Y. TIMES (Feb. 8, 2016), <https://www.nytimes.com/2016/02/09/us/regulatory-gaps-leave-unsafe-lead-levels-in-water-nationwide.html> [https://perma.cc/3EAT-HDBH] (discussing high lead levels found in tap water in cities and towns in the Midwest, East Coast, and the South); see Erin McCormick et al., *Revealed: the 'shocking' levels of toxic lead in Chicago tap water*, THE GUARDIAN (Sep. 21, 2022, 3:00 PM), <https://www.theguardian.com/us-news/2022/sep/21/lead-contamination-chicago-tap-water-revealed> [https://perma.cc/A2K3-W2J8] (discussing high lead levels found in water tested in Chicago homes); see Matt Hoffman, *High lead levels in drinking water found in 139 San Diego child care centers*, KPBS (May 25, 2023, 4:18 PM), <https://www.kpbs.org/news/local/2023/05/25/high-lead-levels-drinking-water-139-san-diego-child-care-centers> [https://perma.cc/9C22-PZG7] (discussing high lead levels found in water tested in San Diego childcare centers).

58. See Robert Glatter, *The 'Other' Source Of Lead Contamination: Your Child's Toys*, FORBES (Apr. 26, 2016), <https://www.forbes.com/sites/robertglatter/2016/04/26/the-other-source-of-lead-contamination-your-childs-toys/?sh=22205eaf4f80> [https://perma.cc/76NM-BHBD]; see also Roger Dobson & Ian Johnston, *Toys from the Seventies and Eighties could be poisoning your children*, INDEPENDENT (Mar. 22, 2015, 1:00 GMT), <https://www.independent.co.uk/news/uk/home-news/toys-from-the-seventies-and-eighties-could-be-poisoning-your-children-10125415.html> [https://perma.cc/76NM-BHBD].

59. See KTVL, *Alert: High Levels of Lead Detected in Some Traditional Cosmetics and Spices*, KTVL.COM, <https://ktvl.com/news/local/alert-high-levels-of-lead-detected-in-some-traditional-cosmetics-and-spices> [https://perma.cc/E5M6-B5SZ] (Dec. 12, 2019, 3:43 PM); see also PEDIATRIC ENV'T HEALTH SPECIALTY UNITS, *TRADITIONAL SOURCES OF LEAD EXPOSURES IN IMMIGRANT POPULATIONS*, UNIV. OF WASH., <https://deohs.washington.edu/pehsu/sites/deohs.washington.edu/pehsu/files/May%202019/immigrant%20lead%20exposures%20CLINICIANS.pdf> [https://perma.cc/URH6-ER8D] (Aug. 2018).

60. See Solcyre Burga, *Why the FDA Is Screening Cinnamon Imports for Lead*, TIME (Nov. 17, 2023, 2:14 PM), <https://time.com/6336969/fda-applesauce-recall-wanabana-lead-cinnamon/> [https://perma.cc/3XCZ-59DK]; see also Anna Boiko-Weyrauch, *Turmeric poisoned their kids. Four Seattle-area cases show gaps in lead testing*, KUOW (Jan. 24, 2022, 10:53 AM), <https://www.kuow.org/stories/turmeric-poisoned-their-kids-four-seattle-area-cases-show-gaps-in-lead-testing> [https://perma.cc/W5CV-L9E3]; see also KTVL, *supra* note 61; see also PEDIATRIC ENV'T HEALTH SPECIALTY UNITS, *supra* note 61.

61. See Laura Kurtzman, *Imported Candy at Top of Contaminated Food List in California*, UCFS (Oct. 25, 2017), <https://www.ucsf.edu/news/2017/10/408791/imported-candy-top-contaminated-food-list-california> [https://perma.cc/N7FL-5APQ]; see also PEDIATRIC ENV'T HEALTH SPECIALTY UNITS, *supra* note 61.

62. See Alexandra Sifferlin, *Worrisome Levels of Lead Found in Imported Rice*, TIME (Apr. 11, 2013), <https://healthland.time.com/2013/04/11/high-levels-of-lead-found-in-imported-rice/> [https://perma.cc/G239-C86X]; see also Jonathan Taraya, *8 Dried plum candies contain 'unacceptable' high levels of lead, California warns*, KTLA, <https://ktla.com/news/california/8-dried-plum-candies-contain-unacceptable-high-levels-of-lead-california-warns/> [https://perma.cc/BGD3-3S3Q] (Feb. 11, 2022, 6:47 AM).

impacted by lead even at the same income levels of their white counterparts.⁶³ Nationwide, black children suffer from elevated blood lead levels at more than double that of their white counterparts.⁶⁴ Likewise, poverty correlates with higher levels of lead in all children's blood.⁶⁵ Yet, disproportionate exposure and harms cannot and should never be reduced to African American or other children of color living in poverty. African American and other children of color often face disproportionate risks as do white children in low-income communities and all children proximate to lead sources mentioned above. Lead has a very local identity in communities that face it and should not be reduced to some generalizations that neglect the range of experiences and exposures that saddle some of our children. Beyond its significant ethical, public health, and empirical warrants, the reality of group-based prejudice and implicit bias means decreased motivation for some officials to address problems perceived as outside of the concerns of their constituency.⁶⁶ Achieving environmental justice and reducing lead disparities and harm requires public policy makers to look to each of these types of disproportionately exposed communities to apply the requisite interventions for primary and secondary prevention. EPA's new strategy to address lead established four straightforward goals: "1. Reduce community exposures to lead sources 2. Identify communities with high lead exposures and improve their health outcomes 3. Communicate more effectively with stakeholders 4. Support and conduct critical research to inform efforts to reduce lead exposures and related health risks."⁶⁷

This mix of primary and secondary prevention approaches across EPA programs reflects the most comprehensive response to lead in the agency's history. This mixture is bolstered by the unprecedented funding levels given to EPA for the elimination of lead from public drinking water service lines and for cleaning up lead and other hazardous contaminants burdening communities in the Bipartisan Infrastructure Law.⁶⁸

The EPA lead strategy begins with a focus on lead sources and the reduction of community exposures—the first best step to protection from lead is its

63. See Brandi M. White et al., *Racial/Ethnic Differences in Childhood Blood Lead Levels Among Children 72 Months of Age in the United States*, 3 J. RACIAL & ETHNIC HEALTH DISPARITIES 145, 145-53 (2016).

64. *Id.*

65. See Marissa Hauptman et al., *Individual- and Community-Level Factors Associated with Detectable and Elevated Blood Lead Levels in US Children Results from a National Clinical Laboratory*, 175 JAMA PEDIATRICS 1252, 1252-60 (2021).

66. See Kevin M. Drakulich, *The Hidden Role of Racial Bias in Support for Policies related to Inequality and Crime*, 17 PUNISHMENT & SOC'Y 541, 544-45 (2015); Dalton Conley, *Getting into the Black: Race, Wealth, and Public Policy*, POL. SCI. Q., Winter 1999–2000, at 595, 596-97.

67. *Final Strategy*, *supra* note 47.

68. See U.S. ENV'T PROT. AGENCY, BIPARTISAN INFRASTRUCTURE LAW: A HISTORIC INVESTMENT IN WATER 1, 1-2 (last visited Mar. 26, 2024), <https://www.epa.gov/system/files/documents/2021-11/e-ow-bid-fact-sheet-final.508.pdf> [<https://perma.cc/23JH-VYN2>]; see also *\$30M BIL advances superfund cleanup on Atlanta's Westside and free EPA job training provides skills, job opportunities for 20 local residents*, U.S. ENV'T PROT. AGENCY (Oct. 10, 2023), <https://www.epa.gov/newsreleases/30m-bil-investment-advances-superfund-cleanup-atlantas-westside-and-free-epa-job> [<https://perma.cc/EU76-WQ68>].

removal from the environment.⁶⁹ The next goal of identifying communities facing high exposures and improving their health outcomes serves a critical role in meeting the first goal and centering the wellbeing of community members in the strategy. The third goal manifests a critical instrumental process. Communicating with parents, educators, community members, local and state public health and other officials, and across agencies is essential to support the first two goals. The last goal addresses the critical gap awareness of likely and possible lead sources in communities to those currently causing harm. Furthermore, this goal encourages the necessary investment in research that better connects environmental and public health interventions with improved health outcomes for communities and their residents.

To accomplish these goals the strategy follows a uniform methodology. Three distinct approaches serve as guideposts that each relevant EPA office addresses with detailed steps followed by measures and metrics:

APPROACH 1: Reduce lead exposures locally with a focus on communities with disparities and promote environmental justice[.] . . .

APPROACH 2: Reduce lead exposures nationally through protective standards, analytical tools, and outreach[.] . . .

APPROACH 3: Reduce lead exposures with a “whole of EPA” and “whole of government” approach[.]⁷⁰

These approaches reflect the recognition of three important aspects of effective lead protection efforts: 1) sources of legacy lead contamination exist in a local context and environment, accordingly environmental remediation and justice require engagement in local communities, 2) current scientific studies make clear that there is no safe level of lead in children’s blood, so past lead protection standards require updating to protect human health, and 3) the authority and responsibility to address lead contamination falls with federal, state, and local governments. Substantial efforts to synchronize efforts across institutions and bureaucracies will have to take place to achieve the agencies goals.⁷¹

In the following section, this Article highlights programmatic commitments from the strategy and recent developments since its publication in 2022. Each highlight falls within a stated objective of the strategy under the purview of a

69. The elimination of lead sources that harm children and adults is the proper goal of public health and environmental protection. Achieving that goal requires the continued commitment of federal and state law makers to fund lead abatement in homes, lead cleanups in soils, and lead service line inventory and replacement. Without the requisite financial commitments from lawmakers, neither federal nor state agencies have the capacity to eliminate the legacy of lead sources that threaten children. This article focuses on the most recent positive steps to address lead sources seen at the federal and state level. While they fall short of lead elimination, there is meaningful progress to observe and replicate.

70. *Final Strategy*, *supra* note 49.

71. Responsibility for and the effective protection of children requires all hands-on deck. It extends to school administrators, healthcare workers, contractors, private landowners, parents, and guardians. EPA’s strategy properly recognizes that successful government intervention requires effective coordination across agency programs and across governmental structures.

national program office with responsibility for addressing legacy lead sources and/or the promulgation of lead protection standards for lead emissions. While the strategy details multiple efforts within each of the program offices, this section notes a single effort within the four offices chosen that marks a significant development in lead protection efforts “to reduce lead exposures nationally through protective standards”.⁷² The offices selected represent the primary regulatory, remediation, and granting offices related to lead within the agency. The actions noted stand out for the substantial impact they will have on national lead source removal or lead protection and in most cases represent improvements explicitly called for by commenters.⁷³

1. Office of Air and Radiation Finding that Lead from Piston Engine Aircraft Poses an Endangerment to Human Health and the Environment

“Piston-engine aircraft are the largest single source of lead emissions to the air in the U.S., contributing [70%] of the lead entering the air annually,” EPA noted when announcing its finding that “lead emissions from certain aircraft engines cause or contribute to lead air pollution that may reasonably be anticipated to endanger public health and welfare under section 231(a) of the Clean Air Act” issued on October 20, 2023.⁷⁴ Approximately one year earlier, on October 18, 2022, while the agency was finalizing its lead strategy, the EPA Office of Air and Radiation issued a proposed endangerment finding under section 231(a) of the Clean Air Act.⁷⁵ The proposed finding reflects an important commitment in EPA’s Final Lead Strategy.⁷⁶ This is largely understated in the strategy where EPA states, “EPA is evaluating, under the Clean Air Act, whether to make a determination that emissions of lead from aircraft engines that operate on leaded fuel cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare.”⁷⁷ The proposed finding itself asserted that leaded fuel aircraft emissions caused or contributed

72. *Final Strategy*, *supra* note 47, at 14. A comprehensive analysis and review of the 2022 EPA strategy as well as a survey of lead protection efforts across the federal government fall beyond the scope of this article but represent important projects for future lead protection research.

73. *See Duty to Protect*, *supra* note 22 at 27-37 (proposing explicit EPA actions to remove lead from air, water, and soil).

74. U.S. ENV’T PROT. AGENCY, EPA-420-F-23-022, EPA FINALIZES ENDANGERMENT FINDING FOR LEAD EMISSIONS FROM AIRCRAFT THAT OPERATE ON LEADED FUEL 1, 1-3 (Oct. 2023), https://www.epa.gov/system/files/documents/2023-10/420f23022_0.pdf [<https://perma.cc/3R6T-XH5X>] [hereinafter ENDANGERMENT FINDING].

75. *Id.*

76. U.S. ENV’T PROT. AGENCY, 540R22006, EPA STRATEGY TO REDUCE LEAD EXPOSURES AND DISPARITIES IN U.S. COMMUNITIES 1, 37 (Oct. 27, 2022), https://www.epa.gov/system/files/documents/2022-11/Lead%20Strategy_1.pdf [<https://perma.cc/8R5V-JXZC>] [hereinafter EPA STRATEGY].

77. The agency language does not prejudice the outcome of its proposal before completing the required process of reviewing and responding to the comments received on the proposed finding. *Id.*

to air pollution which posed an endangerment to human health.⁷⁸

To appreciate the significance of the proposal, a brief review of prior engagement on the issue provides context. EPA's posted record regarding leaded aviation fuel references a 2003 letter from Friends of the Earth "raising the issue" and includes a 2006 formal petition sent by Earthjustice and Golden Gate University School of Law Environmental Law and Justice Clinic on behalf of Friends of the Earth. The letter and the petition request that EPA make a finding of endangerment or in the alternative "commence a study and investigation of the health and environmental impacts of lead emissions from general aviation aircraft."⁷⁹ In 2012, then Assistant Administrator for the Office of Air and Radiation, Gina McCarthy, responded that EPA would seek public comment on the question and consider the issue further.⁸⁰ The record also includes a 2014 request for reconsideration by Earthjustice and Golden Gate University School of Law Environmental Law and Justice Clinic on behalf of Friends of the Earth, Physicians for Social Responsibility, and Oregon Aviation Watch, a 2015 response from Assistant Administrator McCarthy,⁸¹ and a 2021 petition to make a finding of endangerment from leaded aviation fuel sent by Earthjustice and Golden Gate University School of Law Environmental Law and Justice Clinic on behalf of Alaska Community Action on Toxics, Center for Environmental Health, Friends of the Earth, Montgomery-Gibbs Environmental Coalition, Oregon Aviation Watch, County of Santa Clara, California, Town of Middleton, Wisconsin.⁸² In January of 2022, EPA Administrator Michael Regan responded to each petitioner by letter stating that EPA had completed its necessary data analysis and peer review and intended to issue a proposed

78. Proposed Finding That Lead Emissions from Aircraft Engines That Operate on Leaded Fuel Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare, 87 Fed. Reg. 62,753 (Oct. 17, 2022) (to be codified at 40 C.F.R. pts. 87, 1031, 1058).

79. See Lynne Peeples, *Aviation Fuel's Toxic Lead Emissions Draws Lawsuit Against EPA*, Mar 12, 2012 available at https://www.huffpost.com/entry/lead-emissions-children-aviation-fuel_n_1338131 referencing the letter and Petition For Rulemaking & Collateral Relief Friends of The Earth, October 3, 2006 available at Page 1 <https://www.epa.gov/sites/default/files/2016-09/documents/foe-20060929.pdf> [<https://perma.cc/9S56-ZZXU>].

80. Letter & Memorandum from Gina McCarthy, Assistant Adm'r, U.S. Env't Prot. Agency, to Petitioners, Friends of Earth et al. (Jul. 18, 2012) (on file at <https://www.epa.gov/sites/default/files/2016-09/documents/ltr-response-av-ld-petition.pdf> [<https://perma.cc/2FPJ-63QH>]).

81. EPA Response Letter to Friends of the Earth, Physicians for Social Responsibility and Oregon Aviation Watch Regarding Lead Emissions from General Aviation Aircraft (Jan. 23, 2015) (on file at <https://www.epa.gov/sites/default/files/2016-09/documents/ltr-response-av-ld-foe-psr-oaw-2015-1-23.pdf>). Assistant Administrator McCarthy denied the request for reconsideration but affirmed the agency commitment to investigation through additional air modeling, data collection, and analysis.

82. Updated Petition from Earthjustice et al., to Adm'r Michael Regan, U.S. Env't Prot. Agency (Oct. 12, 2021) (on file at <https://www.epa.gov/system/files/documents/2022-01/aviation-leaded-avgas-petition-exhibits-final-2021-10-12.pdf> [<https://perma.cc/FU44-LUPJ>]).

endangerment finding later that year.⁸³ This detailed history helps to show the involved iterative process of policymaking and advocacy necessary to secure progress in protecting public health broadly and specifically to protect children from lead.

The 2023 endangerment finding reflects overwhelming evidence that leaded fuels from these aircraft increases lead in air in and around these communities with general aviation airports.⁸⁴ EPA data includes general populations impacted as well as schools and preschool programs.⁸⁵ While general population estimates varied based on methods of analysis, EPA found that as many as 5,179,000 people lived within 500 meters of a relevant airport facility and that 363,000 of them were children five years old or younger.⁸⁶ Using a more conservative method, EPA data showed that 3,630,000 people lived within 500 meters of a relevant airport runway, including 261,000 age five and under.⁸⁷ Many schools and preschool facilities are also located near airports of concern. EPA found that one hundred and sixty-three thousand children were enrolled in K-12 schools likely impacted by leaded aviation fuel.⁸⁸ These communities bear the burden of air emissions from aviation around the country and EPA's support for the finding cites studies indicating that children's blood lead levels demonstrably increase proximate to relevant airports.⁸⁹ One of the cited studies, conducted in Michigan, found that children living within a kilometer of a relevant airport were 25% more likely to have blood lead levels above five mg/dL and 45% more likely to have blood lead levels greater than ten mg/dL than children living four or more kilometers from a relevant airport.⁹⁰ Moreover, the study found that the predicted probability of a child's blood lead level exceeding five mg/dL living within one kilometer of a relevant airport nearly double based on the increasing volume of piston engine aircraft traffic.⁹¹ The County of Santa Clara, California, one of the joint petitioners in 2021 requesting that EPA make an endangerment finding, also commissioned a study regarding

83. Letter from Michael S. Regan, Adm'r, U.S. Env't Prot. Agency, to Petitioners, Earthjustice et al. (Jul. 18, 2012) (on file at <https://www.epa.gov/system/files/documents/2022-01/ltr-response-aircraft-lead-petitions-aug-oct-2022-01-12.pdf> [<https://perma.cc/79BA-SPPH>]).

84. See generally U.S. ENV'T PROT. AGENCY, EPA-420-R-20-001, NATIONAL ANALYSIS OF THE POPULATIONS RESIDING NEAR OR ATTENDING SCHOOL NEAR U.S. AIRPORTS 1, 13-18 (Feb. 2020), <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100YG4A.pdf> [<https://perma.cc/JD8W-PYGL>] [hereinafter NATIONAL ANALYSIS]; see also U.S. ENV'T PROT. AGENCY, EPA-420-R-23-030, TECHNICAL SUPPORT DOCUMENT (TSD) FOR THE EPA'S PROPOSED FINDING THAT LEAD EMISSIONS FROM AIRCRAFT ENGINES THAT OPERATE ON LEADED FUEL CAUSE OR CONTRIBUTE TO AIR POLLUTION THAT MAY REASONABLY BE ANTICIPATED TO ENDANGER PUBLIC HEALTH AND WELFARE 1, 11-12 (Sept. 2023), <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1018JNV.pdf> [Hereinafter TECHNICAL SUPPORT DOCUMENT].

85. NATIONAL ANALYSIS, *supra* note 86, at 13-18.

86. *Id.* at 13.

87. *Id.* at 14.

88. *Id.* at 16.

89. TECHNICAL SUPPORT DOCUMENT, *supra* note 86, at 4.

90. Zahran et al., *The Effect of Leaded Aviation Gasoline on Blood Lead in Children*, 4 J. ASS'N ENV'T & RES. ECONOMISTS 575, 605 (2017).

91. *Id.*

the impact of lead from a local airport.⁹² It found:

- 1) Children residing within 0.5 miles of Reid-Hillview Airport present with significantly higher BLLs than children more distant of Reid-Hillview Airport; 2) BLLs are significantly and substantively higher among sampled children residing East (and predominantly downwind) of Reid-Hillview Airport; 3) the BLLs of sampled children increase significantly with the volume of measured piston-engine aircraft traffic at Reid-Hillview Airport from the date of blood draw. Moreover, the BLLs of sampled children increase significantly with monthly quantities of aviation gasoline sold to fixed-base operators at Reid-Hillview Airport from the date blood draw.⁹³

The study results, cited by EPA and Santa Clara, County, make clear how significant and necessary EPA's finding is. Children and adults residing, attending school, or working near general aviation airports with piston engine aircraft face significant and disparate exposure to lead and the harms it inflicts.⁹⁴ Addressing these lead exposures extend beyond the reach of all but the federal government. With close to one hundred and seventy-two thousand piston engine aircraft and thousands of general aviation airports across the country, national action by EPA was and is essential to protect these communities from associated lead exposures and their adverse consequences.⁹⁵

The finding under section 231(a) of the Clean Air Act triggers additional federal action.⁹⁶ The Federal Aviation Administration is now required to "address the composition or chemical or physical properties of an aircraft fuel or fuel additive to control or eliminate aircraft lead emissions" under its own authorities.⁹⁷ Based on the finding, EPA is likewise required to "propose and promulgate regulatory standards for lead emissions" from piston engine aircraft.⁹⁸ Administrator Regan's January 2022, letter mentioned above states, "Protecting children's health and reducing lead exposure are two of the EPA's top priorities."⁹⁹ The administration's expeditious movement forward to address this issue certainly reflects a high prioritization. To fulfill this commitment, however, EPA will have to move quickly to publish meaningful regulations that

92. MOUNTAIN DATA GRP., LEADED AVIATION GASOLINE EXPOSURE RISK AT REID-HILLVIEW AIRPORT IN SANTA CLARA COUNTY, CALIFORNIA i, ii (2021), <https://files.santaclaracounty.gov/migrated/RHV-Airborne-Lead-Study-Report.pdf> [<https://perma.cc/9ZRP-QLT3>].

93. *Id.* at 82.

94. TECHNICAL SUPPORT DOCUMENT, *supra* note 86, at 4-5.

95. *Id.* at 7.

96. ENDANGERMENT FINDING, *supra* note 76, at 1-3.

97. *Id.*; see also *FAA Statement on EPA Finding Regarding Lead Emissions from Piston Engine Aircraft*, FED. AVIATION ADMIN. (Oct. 18, 2023), <https://www.faa.gov/newsroom/faq-statement-epa-finding-regarding-lead-emissions-piston-engine-aircraft> [<https://perma.cc/NM3M-FSA9>].

98. ENDANGERMENT FINDING, *supra* note 76, at 1-3.

99. Letter from Michael S. Regan, *supra* note 85.

protect communities impacted by leaded aviation fuel. The endangerment finding reflects Approach 2 detailed in the EPA Strategy to Reduce Lead Exposures and Disparities in U.S. Communities—reduce lead exposures nationally through protective standards, analytical tools, and outreach.¹⁰⁰ It addresses disparate community exposure to lead and sets up the promulgation of meaningful regulation that will “reduce lead exposures nationally through protective standards.”¹⁰¹

2. Office of Water Lead and Copper Rule

A commitment to addressing lead necessarily extends beyond the air to address lead at all its significant sources. Researchers have found that lead in water can have a significant impact on the blood lead levels of children:

Lead rarely occurs in natural water sources, it contaminates drinking water via the corrosion of lead pipes, solder, faucets, cisterns, and other plumbing components containing lead. Exposure to lead from drinking water has been associated with variabilities in children’s blood lead levels (BLLs). Interventions, such as lead pipe replacement, can significantly reduce WLLs [water lead levels], and consequently, BLLs [blood lead levels]. EPA estimated that drinking water generally constitutes more than 20% of average daily lead exposure, 40 to 60% for infants who consume mostly infant formula (dry powder or liquid concentrate) mixed with tap water, and up to 80% of children’s daily exposure in some realistic circumstances even in public water supplies (PWSs) that are not exceeding EPA’s LCR [Lead and Copper Rule].¹⁰²

Lead exposure has a cumulative effect on children.¹⁰³ Even when lead in drinking water is not the primary source, it can have an additive effect along with other sources of harmful lead exposure for children.¹⁰⁴ Even small doses of lead can have adverse effects on children.¹⁰⁵ For some children, lead in drinking water represents their primary lead exposure pathway and basis for harmful blood lead levels.¹⁰⁶

100. *Final Strategy*, *supra* note 49.

101. *Id.*

102. Wexin Lu et al., *Lead Contamination of Public Drinking Water and Academic Achievements Among Children in Massachusetts: A Panel Study*, 22 BMC PUB. HEALTH 1, 1-2 (Jan. 15, 2022).

103. See Gerard Ngueta et al., *Use of a Cumulative Exposure Index to Estimate the Impact of Tap Water Lead Concentration on Blood Lead Levels In 1- to 5-Year-Old Children (Montreal, Canada)*, 124 ENV’T HEALTH PERSP. 388, 388-89 (Mar. 2016).

104. See Patrick Levallois et al., *The Impact of Drinking Water, Indoor Dust and Paint on Blood Lead Levels of Children aged 1–5 years in Montreal (Quebec, Canada)*, 24 J. EXPOSURE SCI. & ENV’T EPIDEMIOLOGY, at 190. (Jan. 2013).

105. *Id.* at 190.

106. See Hanna-Attisha M, LaChance J, Sadler RC, & Champney SA. *Elevated Blood Lead Levels in Children Associated with The Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response*. AM. J. PUB. HEALTH. 283-90 (2016).

The Flint Water crisis illustrated the threat and harm that lead pipes pose to children.¹⁰⁷ Since the water crisis, attention, and awareness of the threat that lead poses to drinking water has grown substantially.¹⁰⁸ EPA's Lead Strategy reflects this increased awareness and concern through commitments included to reduce lead exposure caused by lead service lines.¹⁰⁹ In the prefatory remarks regarding lead in water they write:

Lead exposure through drinking water continues to be a serious risk in many communities, including those facing other environmental justice concerns. . . . There are still 6 to 10 million LSLs [Lead Service Lines] in cities and towns across the country. Many of these are in communities of color or low-income communities. The Biden-Harris Administration has set a goal of removing 100% of LSLs. The Bipartisan Infrastructure Law (BIL) will provide a historic \$15 billion in funding – the first-ever dedicated federal funding – to address lead in drinking water by replacing service lines and carrying out associated activities that are directly connected to identifying, planning, designing, and replacing LSLs. All LSL replacement projects funded by the BIL must replace the entire LSL. To address household affordability concerns, EPA strongly encourages states to fund the private portion of service line replacements at no additional cost to the homeowner. This means that a significant potential source of lead exposure from drinking water will be eliminated for millions of families.¹¹⁰

These comments express an intention to see the primary source of lead in water removed. They also acknowledge that communities do not equally suffer the threats of lead exposure in their drinking water. Race and socioeconomic status lead to disparate levels of lead exposure—a manifestation of environmental injustice.¹¹¹ The remarks also address a longstanding challenge to removing lead from drinking water—if a city replaces the public water lines made of lead who pays to replace the lead lines on privately owned residential property.¹¹² In the section below, this Article highlights two aspects of the EPA Strategy to Reduce

107. Michael Phillips, *In A First, EPA Survey Puts a Number on Lead Pipes Around US*, Associated Press, (April 4, 2023, 6:07 PM), <https://apnews.com/article/epa-lead-pipes-water-florida-infrastructure-pfas-55dc1a30936940312778bc5143166e8e>.

108. See Iris St. Meran, *Heightened Awareness About Dangers Of Lead Poisoning*, Spectrum Local News, (March 22, 2016, 11:21 PM), <https://spectrumlocalnews.com/nys/central-ny/news/2016/03/22/heightened-awareness-about-dangers-of-lead-poisoning> See also T.R. Witcher, *How The Flint Water Crisis Has Impacted US Lead-Pipe Removal Efforts*, ASCE, (August 2021), <https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/article/2021/08/how-the-flint-water-crisis-has-impacted-us-lead-pipe-removal-efforts>.

109. *Final Strategy*, *supra* note 49, at 24-28.

110. *Id.* at 22.

111. See Marissa Hauptman et al., *supra* note 67, at 1253.

112. Michael Phillips, *Some Cities are Digging Up Water Mains and Leaving Lead Pipe in the Ground*, NBC BOS. (July 9, 2023), <https://www.nbcboston.com/news/national-international/some-cities-are-digging-up-water-mains-and-leaving-lead-pipe-in-the-ground/3085114/> [<https://perma.cc/CJ6S-GA3L>].

Lead Exposures and Disparities in U.S. Communities from drinking water.

3. Office of Water Lead Service Line Inventory Review and Replacement Guidance

In the strategy, EPA commits to “Implement the LSL [Lead Service Line] inventory requirements in the LCRR [Lead and Copper Rule Revisions].¹¹³ A critical component of those requirements is supporting the local water systems with the authority and responsibility for maintaining the lead service lines. Shortly before the issuance of the final strategy, EPA acted in this regard by releasing its Guidance for Developing and Maintaining a Service Line Inventory.¹¹⁴ The document supports water systems with their efforts to develop inventories and to provide states with needed information for oversight and reporting to EPA.¹¹⁵ The guidance provides essential information to help water systems comply with the Lead and Copper Rule Revisions requirement to prepare and maintain an inventory of service line materials required by October 16, 2024.¹¹⁶ Successful lead service line removal at minimum requires three basic elements—an accurate inventory of existing lead service lines, the resources for their replacement, the political will in states, cities, and, localities to use available resources for removal. While the Lead Service Line Inventory Review and Replacement Guidance could be mistaken for a relatively insignificant component of an agencywide strategy to reduce lead exposures such an assessment would be incorrect. As noted above, most lead exposure in drinking water results from the use of lead service lines.¹¹⁷ Eliminating this source of lead plays a vital role in protecting children from unsafe lead exposures and yet, knowing a task and successfully accomplishing it can very far apart. Practical steps, grounded in practice, coordination, education, and communication routinely represent the bridge between achieving environmental goals and setting them. The Lead Service Line Inventory Review and Replacement Guidance represents one necessary step along that bridge. Localities with the authority and responsibility for drinking water service line maintenance differ drastically in their expertise, resources, capacity, and constituencies. The Guidance seeks to place these bodies on a level playing field

113. *Final Strategy*, *supra* note 47, at 27.

114. ENVIRONMENTAL PROTECTION AGENCY, EPA 816-B-22-001, GUIDANCE FOR DEVELOPING AND MAINTAINING A SERVICE LINE INVENTORY (2022).

115. *Id.* at 1-2.

116. *Planning and Developing a Service Line Inventory*, EPA, <https://www.epa.gov/ground-water-and-drinking-water/planning-and-developing-service-line-inventory> (last updated Nov. 6, 2023). [<https://perma.cc/X425-3W6Z>]

117. *Basic Information about Lead in Drinking Water*, EPA, <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water#getinto> [<https://perma.cc/M7GG-Y8N6>] (last updated Jan. 5, 2024) (Lead solder, fixtures, and faucets can still introduce lead into drinking water when lead service lines are not in use. In private drinking water systems from well water, unsafe levels of lead have been traced to these sources where lead service lines are not in use.); See Kelsey J. Pieper et al., *Incidence of Waterborne Lead in Private Drinking Water Systems in Virginia*, 13 J. OF WATER & HEALTH 897, 902 (2015).

to enable them to address the lead service lines in their jurisdictions. Most notably, it provides, best practices for inventory development; a readymade inventory template; practical case studies on the development, review, and communication about lead service line inventories; and a discussion on prioritizing the development of inventories in disadvantaged communities and where children spend their time.^{118 119} Since many locales do not have an accurate knowledge of where lead service lines are located, the EPA guidance document provides a set of practical steps to develop a reliable inventory.¹²⁰ Until an accurate inventory is in place, federal resources for their replacement cannot be accessed and children will continue to suffer the risk of exposure.

4. *Office of Water Lead and Copper Rule Improvements*

In the strategy, EPA provides:

EPA is developing a new proposed National Primary Drinking Water Regulation (NPDWR), the LCRI [Lead and Copper Rule improvements], to strengthen the regulatory framework and address lead in drinking water. EPA identified the following priority areas for improvement: Proactive and equitable LSLR [Lead Service Line Replacement]; strengthening compliance tap sampling to better identify communities most at risk of lead in drinking water and to compel lead reduction actions; and reducing the complexity of the regulation through improvement of the action and trigger level construct.¹²¹

Under Approach 2 (Reduce lead exposures nationally through protective standards, analytical tools, and outreach), this section presents the EPA's intention to engage in regulatory action regarding drinking water to support primary prevention. This article focuses on the lead and copper rule improvements commitment to "proactive and equitable" lead service line replacement. On November 30, 2023, the EPA announced the proposed Lead and Copper Rule Improvements. Within the proposal, the agency states, "water systems must replace LSLs [Lead Service Lines] and certain galvanized service lines regardless of the lead levels occurring in tap or other drinking water samples."¹²² Moreover, the rule sets a ten-year timeframe for this to take place.¹²³

118. *Planning and Developing a Service Line Inventory*, *supra* note 118.

119. By including a detailed discussion of protecting disadvantaged communities and places with increased risk of children, the EPA encourages potential federal funds recipients in addressing the disparate risks that children face.

120. Michael Phillis, *Some Cities Could be Left Behind on Lead Pipe Replacements*, AP NEWS (Aug. 26, 2022), <https://apnews.com/article/health-michigan-iowa-dubuque-flint-5c47afcfe8ddb54db5d5176422e7f95c> [<https://perma.cc/C4JU-QFDS>].

121. *Final Strategy*, *supra* note 47, at 26-27.

122. EPA, EPA-HQ-OW-2022-0801, NATIONAL PRIMARY DRINKING WATER REGULATIONS FOR LEAD AND COPPER: IMPROVEMENTS (2023).

123. *Id.* at 8.

Until lead service lines have been removed, they will continue to pose a risk. Under the Lead and Copper Rule Improvements, EPA offers several additional actions to protect communities from the risk these lines pose. The article focuses on two—lowering the lead action level and strengthening protections to reduce exposure.¹²⁴ The lead action level represents the level at which water systems are required to act to address lead contamination when testing reveals lead exceedances.¹²⁵ Under the prior rule, the lead action level was 15 µg/L.¹²⁶ The proposed Lead and Copper Rule Revisions lower the action level down to 10 µg/L.¹²⁷ Lowering the lead action level to 10 µg/L, is an improvement over the prior Lead and Copper Rule 15 µg/L action level. The lower number directs water systems to address lead exposures that previously were not required. These actions include primary prevention modifications that reduce lead leaching into drinking water.¹²⁸ Additionally, the proposed rule requires that water systems increase education and notification to consumers related to system work that could impact lead in the service lines, as well as, providing testing results within 72 hours irrespective of the results.¹²⁹ The existing rule already requires 24-hour notice to a home that shows a lead action level exceedance.¹³⁰ Moreover, the proposed rule dictates that systems with “multiple lead action level exceedances...make filters certified to reduce lead available for consumers.”¹³¹ For primary and secondary prevention the Lead and Copper Rule Revisions above represent significant steps forward in protecting children and adults from lead exposure.

5. Office of Chemical Safety and Pollution Prevention Hazard Standards and Clearance Levels for Lead in Paint, Dust and Soil

In its 2022 EPA Strategy to Reduce Lead Exposures and Disparities in U.S. Communities, the agency committed to revisit the dust lead hazard standards and the dust lead clearance levels, under approach 2, “Reduce lead exposures

124. *Proposed Lead and Copper Rule Improvements*, EPA, <https://www.epa.gov/ground-water-and-drinking-water/proposed-lead-and-copper-rule-improvements#:~:text=EPA%20is%20proposing%20to%20require%20water%20systems%20to%20replace%20lead,where%20lead%20service%20lines%20are> (last updated Jan. 12, 2024) [<https://perma.cc/W6UD-ZJY9>].

125. James Salzman, *The Past, Present and Future of The Safe Drinking Water Act (2022 Revision)*, 22 UCLA PUB. L. & LEGAL THEORY SERIES 1, 12 (2022). (“The standard methodology requires that utilities collect samples from household taps that have not been used for six hours. If more than 10% of the samples exceed the action level (15 ppb for lead), certain water treatment steps become mandatory for the PWS.”), <https://escholarship.org/uc/item/5dv91837>.

126. *Proposed Lead and Copper Rule Improvements*, EPA (Jan. 12, 2024), <https://www.epa.gov/ground-water-and-drinking-water/proposed-lead-and-copper-rule-improvements#:~:text=EPA%20is%20proposing%20to%20require%20water%20systems%20to%20replace%20lead,where%20lead%20service%20lines%20are>.

127. *Id.*

128. EPA, National Primary Drinking Water Regulations for Lead and Copper: Improvements (Sep. 21, 2023) 176-177, https://www.epa.gov/system/files/documents/2023-11/proposed-lcri_pre-pub-version-11_29_23.pdf.

129. *Id.* at 10-11.

130. *Id.* at 43.

131. *Id.* at 18.

nationally through protective standards, analytical tools, and outreach.”¹³² In describing the lead problem they write:

Millions of people, especially those living in communities with environmental justice concerns, continue to be exposed to lead at home and in other buildings where lead-based paint is found in deteriorating condition (peeling, chipping, cracking, or damaged). Communities that have a high percentage of housing or buildings built before 1978 —and especially those built before 1940 — are at higher risk from historical use of lead-based paint.¹³³

The issue of lead based related exposure in homes and other buildings falls squarely within the work of many commenters addressing lead.¹³⁴ In that regard, lead hazard standards and clearance levels play a fundamental role in the reducing lead exposures under the Toxic Substances Control Act.¹³⁵ The agency explains the use of the lead hazard standard as the level above which a hazard exists. In describing its use, they write “[t]he risk assessor will take samples from the building and compare the dust-lead level from the sample to the applicable hazard standards. If the sample is above the standard, then a dust-lead hazard is present.”¹³⁶ The proposed action would change the existing lead hazard standard for dust from 10 micrograms $\mu\text{g}/\text{ft}^2$ for floors and 100 $\mu\text{g}/\text{ft}^2$ for window sills to “any level greater than zero reported by an EPA-recognized laboratory.”¹³⁷ The agency grounds the shift to a more protective standard based on “the fact that there is no level of lead in dust that has been found to be safe for children.”¹³⁸ In conjunction with the revised dust lead hazard standard, EPA also committed to revisit the dust lead clearance levels in its 2022 Strategy to Reduce Lead Exposures and Disparities in U.S. Communities.¹³⁹ In its 2023 proposal, the agency revises its dust-lead clearance levels from “10 $\mu\text{g}/\text{ft}^2$ for floors, 100 $\mu\text{g}/\text{ft}^2$ for window sills and 400 $\mu\text{g}/\text{ft}^2$ for window troughs to 3 micrograms per square foot ($\mu\text{g}/\text{ft}^2$) for floors, 20 $\mu\text{g}/\text{ft}^2$ for window sills and 25 $\mu\text{g}/\text{ft}^2$ for window troughs.”¹⁴⁰ Dust lead clearance levels are used to determine when a lead abatement or removal activity has adequately addressed lead

132. *Final Strategy*, *supra* note 47.

133. *Id.* at 16.

134. *See* Hope Kerpelman, *supra* note 15, at 828; Benfer, *supra* note 22, at 493; Emily A. Benfer, et al., *supra* note 22, at 146; Ransom, et. al., *supra* note 23, at 4.

135. 15 U.S.C. § 2683.

136. *See* EPA, EPA’S PROPOSAL TO STRENGTHEN DUST-LEAD STANDARDS 1, https://www.epa.gov/system/files/documents/2023-07/DLHS%20DLCL%20Reconsideration%20Proposed%20Rule%20Fact%20Sheet_0.pdf.

137. *See Id.*

138. EPA, *Biden-Harris Administration Proposes to Strengthen Lead Paint Standards to Protect Against Childhood Lead Exposure* (Jul. 12, 2023), <https://www.epa.gov/newsreleases/biden-harris-administration-proposes-strengthen-lead-paint-standards-protect-against>; *See also* EPA’S PROPOSAL TO STRENGTHEN DUST-LEAD STANDARDS, *supra* note 138, at 2. (EPA supports this standard based on “health-only factors.”)

139. *Final Strategy*, *supra* note 47.

140. *See* EPA’S PROPOSAL TO STRENGTHEN DUST-LEAD STANDARDS, *supra* note 138.

contamination.¹⁴¹ After the completion of a lead abatement or removal action, surfaces will be tested to determine whether dust lead has been removed at a level that ensures that any remaining lead dust falls below the dust lead clearance level.¹⁴² EPA identifies the revised clearance as “the lowest levels EPA believes are safe, effective and reliable.”¹⁴³

6. Revised Residential Soil Lead Guidance for Contaminated Sites to Further Reduce the Potential for Exposure to Lead in Soil

EPA provides a detailed description of the problem of lead in soils.¹⁴⁴ Distinct from the more narrowly caused exposure threats in the discussion above, soil lead has many sources.¹⁴⁵ In identifying the problem, EPA writes:

Lead is a naturally occurring element generally found in soil at low levels. In many locations across the United States, however, the concentrations of lead in soils can be much higher because of human activities – especially in and around urban areas, in areas with lead mining and smelting activities, and near older homes with lead-based paint. Today, this legacy of lead overburdens communities impacted by the activities of lead producing and using industries; often these are communities of color and low-income neighborhoods. Soil-lead contamination can occur from past industrial operations that involved lead, from lead-based paint cracking, flaking, and peeling off homes and buildings, and from past use of leaded gasoline, especially in housing near highways or heavily travelled city streets. Lead contamination from the past, often from multiple sources, can accumulate and remain an ongoing threat. Children and adults can be exposed to lead in soil and dust through incidental ingestion of contaminated soils by touching their mouth with their hands (typically in young children), but also by adults working in soils or gardening. Children may also ingest soil and dust by placing non-food items in their mouths. Soil contaminated with lead can be tracked into homes or other buildings, which can result in ingestion of contaminated house dust. In some cases, eating fruits and vegetables grown in lead-contaminated soil is another route of exposure.¹⁴⁶

On June 12, 2023, the EPA sent Soil Lead Guidance for Hazardous Waste

141. *Id.* at 2.

142. *Id.* at 1-2.

143. *Id.* at 3. (EPA states that the revised dust lead clearance levels consider factors “such as achievability” in addition to health.)

144. *Final Strategy*, *supra* note 47, at 30.

145. CDC, *Lead in Soil*, CHILDHOOD LEAD POISONING PREVENTION (Dec. 16, 2022), <https://www.cdc.gov/nceh/lead/prevention/sources/soil.htm#:~:text=Deposits%20from%20leaded%20gasoline%2C%20exterior,and%20homes%20built%20before%201978> [https://perma.cc/FEY4-WJYN].

146. *Final Strategy*, *supra* note 47, at 30.

Sites to the Whitehouse Office of Management and Budget for review.¹⁴⁷ Several months later, on January 17, 2024, EPA issued Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. The guidance directs agency staff on the proper screening levels for lead found in soils at Superfund sites. The prior guidance dated to a 1994 interim guidance memorandum and a 1998 clarification to the 1994 guidance.¹⁴⁸ The new guidance replaces the 1994 guidance based on current scientific understandings that there is no safe level of lead in a child's blood and the Center for Disease Control's updated blood lead reference value of 3.5 µg/dL. Under the former guidance, residential screening levels were established at a recommended level of 400 ppm for lead in soil for residential land use.¹⁴⁹ Lead screening levels provide the basis for determining when soils containing lead require site specific evaluation for potential clean up action.¹⁵⁰ The existing guidance document cites an outdated Centers for Disease Control's (CDC) blood reference value of 10 µg/dL.¹⁵¹ In the twenty nine years since it was drafted, EPA has changed its reference dose on two separate occasions consistent with heightened scientific awareness of the risk that low levels of lead pose to children and that there is no safe level of lead in a child's blood.¹⁵² In order to protect children and adults from lead poisoning, standards and approaches have advanced substantially since EPA issued its soil lead guidance in 1994. The updated soil lead guidance represents a critical step forward in protecting children from lead exposure.

The new guidance makes two critical improvements to the prior document. It lowers the recommended screening level for lead to 200 ppm generally and to 100 ppm when "an additional source of lead is identified" such as lead based paint or lead water service lines.¹⁵³ In discussing the application of the 100-ppm level, the agency explains:

The recommended RSL of 100 ppm considers aggregate lead exposure

147. Off. of Info. And Regul. Aff., Proposed Rule for Soil Lead Guidance for Hazardous Waste Sites (Jun. 12, 2023), <https://www.reginfo.gov/public/Forward?SearchTarget=RegReview&textfield=lead&Image61.x=19&Image61.y=10> [https://www.reginfo.gov/public/Forward?SearchTarget=RegReview&textfield=lead&Image61.x=19&Image61.y=10https://perma.cc/8FWT-XU9D].

148. See *Memorandum: OSWER Directive: Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, EPA (Aug. 1994) [hereinafter *OSWER 1994*] <https://semspub.epa.gov/work/HQ/175347.pdf>; *Memorandum: OSWER Directive: Clarification to the 1994 Revised Interim Soil Lead (Pb) Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, EPA (Aug. 1998) [hereinafter *OSWER 1998*] <https://semspub.epa.gov/work/HQ/175346.pdf>.

149. *OSWER 1994*, *supra* note 150, at 3.

150. *Id.* Screening levels are defined as a level of contamination above which there may be enough concern to warrant site-specific study of risks.

151. *Id.* at 7.

152. CDC, *Overview of Childhood Lead Prevention*, CHILDHOOD LEAD POISONING PREVENTION (Oct. 20, 2023) <https://www.cdc.gov/nceh/lead/overview.html> [https://www.cdc.gov/nceh/lead/overview.htmlhttps://perma.cc/LF2V-CF9U].

153. Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, January 17, 2024, available at <https://semspub.epa.gov/work/HQ/100003435.pdf> (epa.gov).

and increased risk to children living in communities with multiple sources of lead contamination. In making site-specific decisions on when to use an RSL of 100 ppm, EPA regions may use national data sets identified by OLEM for this purpose. EPA regions may also use site-specific sources of information (e.g., data from the local health department or local public water system), alone or in combination with national data sets, to select an appropriate RSL of either 100 ppm or 200 ppm.¹⁵⁴

This approach addresses the additive harm faced by children exposed to multiple lead sources—making sure that soil screening levels remain protective for populations with additional lead exposures.¹⁵⁵ In doing so, the EPA moves the superfund program forward to reflect the greater scientific understanding of both the adverse impacts of even low levels of blood lead and the additive risks of lead exposure to children from multiple sources.¹⁵⁶

The Superfund program represents the nation's primary program for lead soil removal. In a 2020 bulletin on lead and the Superfund program the agency explains:

Superfund directs EPA to clean up contaminated sites where hazardous substances, such as lead, have been released into the environment. Lead is one of the most common contaminants found at Superfund sites; there are presently over 900 Superfund sites with lead as a contaminant of concern. . . . A 2019 EPA study of two decades of children's blood lead levels (BLLs) in six states indicated that Superfund cleanups lowered the risk of elevated BLL for children living within 2 km (1.24 miles) of lead-contaminated sites by [8-18%].¹⁵⁷

The Superfund program conducts remediation at the nation's most contaminated sites.¹⁵⁸ Under the program, cleanup actions are undertaken by the federal

154. Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, January 17, 2024, available at <https://semspub.epa.gov/work/HQ/100003435.pdf> (epa.gov).

155. *Id.* at 6 2.

156. The guidance explains, "As previously stated, evolving science on lead has demonstrated additional adverse impacts of lead exposure well below 10 µg/dL since the 1994 guidance was issued. Moreover, children could be exposed to multiple sources of lead other than contaminated soil/dust (e.g., lead water service lines, lead-based paint, or non-attainment areas where the air lead concentrations exceed NAAQS) at Superfund and RCRA Corrective Action sites. Studies conducted at or near Superfund sites provide evidence that aggregate lead exposure has generally resulted in blood lead levels that are higher than those of most U.S. children as indicated by the observation of a disproportionate number of elevated blood lead levels in such communities." *Id.* at 4.

157. *EPA Reduces Lead Exposures Through Cleanup Enforcement 2020*, EPA, 1 (Nov. 2020) <https://www.epa.gov/sites/default/files/2020-11/documents/cleanup-lead-bulletin-2020-final.pdf> (<https://perma.cc/98QJ-L3YF>).

158. Heather Klemick et al., *Superfund Cleanups and Children's Lead Exposure*, 100 J. ENVIRON. ECON. AND MANAGE. (Mar. 2020)

government, private parties responsible for contamination, or states.¹⁵⁹ In EPA residential lead cleanups, legacy lead contamination in soils is regularly removed from homes and neighborhoods where children play and are exposed.¹⁶⁰ Residential lead cleanups often address contamination from legacy lead mining operations and smelters and can involve a large number of residences.¹⁶¹ Superfund cleanups reduce lead exposure using primary prevention through lead removal and secondary prevention through education, community outreach, and coordination with local health agencies; these combined interventions lead to a demonstrable reduction in childhood blood lead levels.¹⁶² The Bipartisan Infrastructure Law directed 3.5 billion dollars to EPA for Superfund cleanup and reinstated the Superfund tax after twenty-five years.¹⁶³ As these cleanups tackle old and new sites with legacy lead contamination, the updated soil lead guidance provides an important improvement on prior protections for children under the program. Through its updated guidance that considers new scientific knowledge concerning the harmful impacts of lead on children and the availability of resources for cleanup EPA can substantially strengthen primary prevention of lead exposure from soils.

III. STATE POLICIES AND PROGRAMS

A. *Intro – The State Role in Lead Protection*

As the preceding discussion of federal actions addressing water makes clear, state governments play a critical role in protecting children and others from lead exposure. The billions of dollars of funding for lead service line replacement in the Bipartisan Infrastructure Law depends on state and local government assessment and identification of lines for replacement.¹⁶⁴ In a similar fashion, CDC's creation of a new blood lead reference value requires state policymakers to adopt that new value in selecting screening levels within their lead testing and

159. *See generally, supra* note 150. (a discussion of private party lead remediation actions); *Lead at Superfund Sites*, EPA (Jan. 17, 2024) <https://www.epa.gov/superfund/lead-superfund-sites> (<https://www.epa.gov/superfund/lead-superfund-siteshttps://perma.cc/BKZ4-TK6V>) (examples of EPA funded lead cleanups).

160. Heather Klemick et al., *supra* note 160, at 21.

161. One of the country's largest residential lead cleanups is ongoing at the Omaha Lead Superfund Site in Omaha, Nebraska. "It encompasses 27 square miles of lead contaminated soil around downtown Omaha and 42,000 residential properties at the Site have been tested for lead. Over 13,000 of the approximately 14,000 residential properties that showed high levels of lead concentration have been cleaned up." EPA, *supra* note 150, at 5.

162. Klemick, et al., *supra* note 160, at 21.

163. *Bipartisan Infrastructure Law: Environmental Remediation at Superfund Sites*, EPA https://www.epa.gov/system/files/documents/2022-03/bipartisan-infrastructure-law-fact-sheet_investments-in-superfund-remedial-program_0.pdf (https://www.epa.gov/system/files/documents/2022-03/bipartisan-infrastructure-law-fact-sheet_investments-in-superfund-remedial-program_0.pdfhttps://perma.cc/7JLL-6V58).

164. *Final Strategy, supra* note 47, at 1-3.

reporting programs to make it effective within their jurisdictions.¹⁶⁵ The analysis and discussion that follows points to best state practices in lead protection programs. As public health professionals and commenters make clear, protecting children from lead exposure requires primary prevention.¹⁶⁶ Along with primary prevention efforts, best state practices include testing, reporting, and other secondary prevention methods.¹⁶⁷ The Howard ECJC looked across both categories to assess state efforts. Preliminary results show that several states have developed robust primary and secondary protection regimes. These states' leadership provides a roadmap of best practices for consideration and broader adoption.

B. Children at Risk: Gaps in State Lead Screening Policies Report by Safer Chemicals, Healthy Families

In 2017, Safer Chemicals, Healthy Families published *Children at Risk: Gaps in State Lead Screening Policies Report*.¹⁶⁸ The report focuses on state efforts to screen children suffering from elevated blood lead levels and provides an assessment of best practices in related secondary prevention techniques.¹⁶⁹ The report begins with the affirmation that primary prevention strategies that eliminate sources of lead exposure are the best means to protect children from lead exposure.¹⁷⁰ The report then makes the important point that, “[R]egular blood lead testing is critical for identifying very young children with elevated levels early enough that intervention can prevent or mitigate long-term developmental damage.”¹⁷¹ While blood lead testing does not eliminate or even reduce lead exposure, it does provide valuable information to parents and public health officials. Along with robust efforts to eliminate and reduce lead exposure, secondary prevention methods like testing represent an important part of a comprehensive lead protection program.

C. HUSL Fifty State Review – Project Description and Research Methodology

In some ways, the Howard ECJC survey begins where the *Children at Risk Report* ends. Bringing together an examination of both primary and secondary prevention programs, the project explores both aspects of state protection

165. See Jeremy J. Michel et al., *More Guidelines Than States: Variations in U.S. Lead Screening and Management Guidance and Impacts on Shareable CDS Development*, 20 BMC PUBLIC HEALTH 1, 3-4 (2020), <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-020-8225-8> [<https://perma.cc/FYZ2-DXAF>] (discussing the divergent guidelines regarding lead across states.)

166. Emily A. Benfer, et al., *supra* note 22, at 13-14.

167. Jennifer Dickman, *Children at Risk: Gaps in State Lead Screening Policies*, 1 SAFER CHEMICALS HEALTHY FAMILIES 36 (2017), https://toxicfreefuture.org/wp-content/uploads/2017/01/saferchemicals.org_children-at-risk-report.pdf [<https://perma.cc/W5TN-3T97>].

168. *Id.*

169. *Id.*

170. *Id.*

171. *Id.*

programs to find best practices in state lead protection programs. The project began in 2020 when a talented group of students surveyed the laws and programs across fifty states and the District of Columbia. Their work began with state websites and state codes to assess each jurisdiction's lead protection programs. The project goal was to provide community activists, policy makers, and lawmakers with a comparative evaluation of their jurisdictions' lead protection efforts. Law and policy analysis grounds the survey and the determination of "best practices" for health protection. The project does not assess the lead risks within each state, the number of children with elevated blood lead levels, compliance with federal lead protection standards across media, nor the number of lead sources that may result in lead exposures.¹⁷²

D. Preliminary Findings

Although the final version of the ECJC survey has not yet been released, the preliminary results provide important insight into what the nation's most protective lead poisoning prevention programs do.¹⁷³ These policies and practices reflect the deliberate efforts by both lawmakers and policy makers to invest resources and attention to this serious issue. These lead poisoning prevention efforts and investments offer substantial dividends when utilized. The elimination of lead exposure in children provides well established benefits to the individual, their families, and the entire community.¹⁷⁴ Estimates of the financial benefits of lead elimination reach \$84 billion.¹⁷⁵ States derive significant savings from these investments in lower costs over a range of services such as medical care, policing, incarceration, and state medical service costs.¹⁷⁶ Moreover, states derive the benefits of a higher performing workforce and greater tax revenues over the course of a lifetime.¹⁷⁷ All in all, the investment will pay much more in benefits than it costs.¹⁷⁸ Beyond the cold logic of financial investments and returns, states have a responsibility to protect children from known dangers like these. The Howard ECJC preliminary survey results illustrate how states can fulfill that duty. Through examining what has been done by states and jurisdictions, the article seeks to identify the programmatic mechanisms that move states and their citizens ever closer to the

172. A comprehensive assessment of this type would provide a valuable resource for keeping track of lead and specific exposure risks.

173. Howard ECJC Fifty State Survey available with author.

174. See Elise Gould, *Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control*, *Environ Health Perspectives*, ENV. HEALTH PERSPECT. 1162, 1163-1165 (2009) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2717145/> [<https://perma.cc/S3AV-3GP4>] (discussing benefits of lead hazard controls.)

175. See Patrick N. Breysse, *Lead Elimination for the 21st Century*, 25. *JOURNAL OF PUBLIC HEALTH MANAG. PRAT.* Jan., Feb. 2019, at 2 at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8827389/>.

176. Gould, *supra* note 177, at 1163-65.

177. Gould, *supra* note 177, at 1165.

178. Breysse, *supra* note 178.

elimination of lead hazards to pregnant women and children.

The preliminary findings provide a set of best practices in both primary and secondary prevention. Primary prevention practices in the survey fall into three categories—reducing/eliminating lead hazards in facilities; training and certification for lead abatement providers; and reducing lead exposures in pre-1978 residential rental properties.¹⁷⁹ Secondary prevention practices have been divided into several key categories. These findings update some of the testing results from the Safer Chemicals for Healthy Children Report, but also examine reporting requirements, policies to prevent retaliatory evictions, case management services for children with elevated blood lead, and the existence of a state lead protection program to coordinate and oversee efforts.¹⁸⁰

E. Primary Prevention

1. Restrict Lead Hazards in Schools, Daycares, Public Buildings, and/or Child-occupied Facilities

The most effective way to protect people from lead exposure is its removal from the environment.¹⁸¹ The greatest risk of lead exposure for children occurs from infancy to seventy-two months.¹⁸² During these ages, even low levels of lead exposure can inflict significant developmental harms to children.¹⁸³ Accordingly, eliminating lead exposure for children at early ages produces substantial health benefits.¹⁸⁴ Since young children spend most of their time in a small number of places, assessing and eliminating or reducing lead in these environments provides significant benefits in reducing lead exposure overall. States leading in these efforts have developed legal requirements for lead hazard reduction in residential dwellings and child occupied facilities.¹⁸⁵ Abatement efforts that address the primary environmental sources of lead—paint, dust, plumbing, and soil offer the most effective environmental protection regimes.¹⁸⁶ The Fifty State Survey showed that states use a range of approaches to address lead hazards. Some provide funding for residential abatement efforts by low-

179. Howard ECJC Fifty State Survey available with author.

180. Howard ECJC Fifty State Survey available with author.

181. Benfer, *supra* note 22, at 13-14.

182. *Childhood Lead Poisoning Prevention: Health Effects of Lead Exposure*, CENTERS FOR DISEASE CONTROL AND PREVENTION (Sep. 2, 2022), <https://www.cdc.gov/nceh/lead/prevention/health-effects.htm#:~:text=The%20health%20effects%20of%20exposure,still%20developing%20and%20growing%20rapidly> [https://perma.cc/Y6H4-ADVQ]. See also Richard Rabin, *Warnings Unheeded: A History of Child Lead Poisoning*, 79 AM J. OF PUB. HEALTH 1668, 1672-73 (1989).

183. Joel T. Nigg et al., *Low Blood Lead Levels Associated with Clinically Diagnosed Attention-Deficit/Hyperactivity Disorder and Mediated by Weak Cognitive Control*, 63 BIOLOGICAL PSYCHIATRY 325, 331 (2008) (Author's Manuscript).

184. *10 Policies to Prevent and Respond to Childhood Lead Exposure*, PEW (Aug. 30, 2017) <https://www.pewtrusts.org/en/research-and-analysis/reports/2017/08/10-policies-to-prevent-and-respond-to-childhood-lead-exposure> [https://perma.cc/KR93-HQRW].

185. Howard ECJC Fifty State Survey available with author.

186. Malcoe, *supra* note 56, at 226.

income families, while others set a requirement for rental property owners and other child occupied facilities.¹⁸⁷ The Fifty State Survey found that in some states, lead in plumbing and lead paint are the focus and in others only lead dust, lead paint, and lead in soils are addressed.¹⁸⁸ The best practices, however, in primary prevention address lead across all four primary sources of exposure in child occupied facilities and includes funding for low income residents and low income housing and enforcement programs to ensure that children are protected in the spaces where they spend time.

2. Offer Training and Certification Program for Lead Abatement Service Providers

Lead abatement activities represent the mechanism for lead removal in homes.¹⁸⁹ They should be distinguished from renovation, repair, and painting activities.¹⁹⁰ Lead abatement “is a specialized activity designed to address lead in the home.”¹⁹¹ To ensure that these services are carried out by well-trained and prepared contractors, EPA-authorized states offer training and certification programs.¹⁹² These programs train contractors on the pre-1978 housing and child-occupied facilities.¹⁹³ They include scientifically based protocol and procedures for lead inspection, assessment, and removal.¹⁹⁴ Lead inspection and abatement activities that are improperly conducted pose a substantial threat to children, as they may fail to properly identify the presence of hazards and effectively remove them safely.¹⁹⁵

187. Illinois and Iowa, respectively. Howard ECJC Fifty State Survey available with author.

188. Howard ECJC Fifty State Survey available with author.

189. See EPA’s Proposal to Strengthen Dust-Lead Standards, ENV’T PROT. AGENCY https://www.epa.gov/system/files/documents/2023-07/DLHS%20DLCL%20Reconsideration%20Proposed%20Rule%20Fact%20Sheet_0.pdf [<https://perma.cc/PZ9E-HLDS>] (last visited Jan. 23, 2024).

190. *Lead Abatement Versus Lead RRP*, EPA (June 6, 2023), <https://www.epa.gov/lead/lead-abatement-versus-lead-rrp> [<https://perma.cc/B6NU-FCU5>].

191. *Id.*

192. Certification in states without authorized programs must be issued by EPA. See *Lead-Based Paint Abatement and Evaluation Program*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (Dec. 19, 2023), <https://www.epa.gov/lead/lead-based-paint-abatement-and-evaluation-program-overview> [<https://perma.cc/V6XJ-J69Z>].

193. *Id.*

194. See EPA’s Proposal to Strengthen Dust-Lead Standards, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, 2, https://www.epa.gov/system/files/documents/2023-07/DLHS%20DLCL%20Reconsideration%20Proposed%20Rule%20Fact%20Sheet_0.pdf [<https://perma.cc/ZJE9-TFW3>] (Last visited Jan. 19, 2024).

195. See Greg B. Smith, *NYCHA Falsely Certified This Brooklyn Child’s Apartment Lead-Free. Now He Has Lead Poisoning — and He’s Not Alone*, THE CITY (Jan. 11, 2021), <https://www.thecity.nyc/2021/01/11/nycha-falsely-certified-brooklyn-child-apartment-lead-free/> [<https://perma.cc/S27B-46NT>]. See also *Report Says NYCHA Violated Lead Paint Regulations Since at Least 2013*, ABC (Dec. 10, 2020), <https://abc7ny.com/nycha-report-lead-paint-regulations-nyc-public-housing-new-york-city-authority/8667776/> [<https://perma.cc/FR9D-LB36>], for discussions of failures by the New York City Housing Authority and its impacts on residents.

3. Adopted Policies to Reduce Lead exposure in Pre-1978 Residential Rental Properties

States with robust lead protection programs that focused on protecting children also recognized the challenge of addressing lead in rental units.¹⁹⁶ In 1992, Congress passed the Lead Disclosure Rule to address the threat of lead for persons leasing or buying pre-1978 housing.¹⁹⁷ While the rule requires disclosure of lead hazards in rental housing, it does not mandate that hazards be abated.¹⁹⁸ Preliminary results of the Howard ECJC Fifty State Survey show that some states move beyond federally required disclosures of lead in rental property to require removal of identified lead hazards.¹⁹⁹ However, some only do so after a child has tested positively for elevated blood lead levels.²⁰⁰ As Benfer and other commenters point out, preventing children from being lead poisoned requires lead abatement before a child suffers the harms of elevated blood lead levels.²⁰¹ The best practice by states require the abatement of lead hazards for landlords of pre-1978 housing without the precondition of elevated blood lead levels in one or more children.²⁰²

IV. CONCLUSION

Unlike many other debilitating childhood diseases, lead poisoning is fully preventable.²⁰³ It results from the introduction of lead into the human environment in consumer products, industrial activities, and mining.²⁰⁴ Its sources are known, and its remediation achievable. The harm it causes is

196. David E. Jacobs, et al., *The Prevalence of Lead-Based Paint Hazards in U.S. Housing*, 110 ENV'T. HEALTH PERSP. 602 (2002). <https://ehp.niehs.nih.gov/doi/epdf/10.1289/ehp.021100599> [<https://perma.cc/P2XB-AG7V>].

197. *The Lead Disclosure Rule*, US HOUSING AND URBAN DEV., https://www.hud.gov/program_offices/healthy_homes/enforcement/disclosure [<https://perma.cc/6HGF-38QG>] (Last visited Jan. 19, 2024).

198. *EPA HUD Fact Sheet: EPA and HUD Move to Protect Children from Lead-Based Paint Poisoning; Disclosure of Lead-Based Paint Hazards in Housing*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, 2, https://www.hud.gov/sites/documents/DOC_12351.PDF [<https://perma.cc/T43R-5Y6G>] (Last revised Dec. 1996).

199. For example, California, the District of Columbia, Illinois, and Iowa all require abatement of identified lead hazards in rental housing. Howard ECJC Fifty State Survey available with author.

200. Illinois and Iowa do not require lead hazard identification or abatement until a child who visits or resides in the premises has tested positively for elevated blood lead levels. Howard ECJC Fifty State Survey available with author.

201. Emily A. Benfer, et al., *supra* note 22, at 14.

202. An overwhelming majority of states fall into one of three tiers. Tier one states require lead mitigation or abatement by landlords after hazard identification by a certified inspector. Tier two states require lead mitigation or abatement by landlords after a positive screening for elevated blood lead levels. Tier three states only require that landlords disclose identified lead hazards that are consistent with federal environmental protection standards.

203. Benfer, *supra* note 22, at 497.

204. Dignam et al., *supra* note 3, at 2.

devastating, long lasting, and even life threatening. Our failure to address lead poisoning is a matter of will and commitment. This Article points out federal and state actions that reflect the political will and financial commitment to broaden and deepen the protections available until we have the will and commitment to eliminate the threat that lead poses. While these measures fall short of complete cures or solutions, they do matter. They all reduce lead exposure and represent positive steps forward to build upon. They only occurred because of substantial amounts of time, effort, and sacrifice at multiple levels. Those responsible for them deserve acknowledgment and recognition for what they have achieved. The EPA lead strategy goes far beyond the handful of provisions discussed above. As a comprehensive strategy, it advances the agencies overall protection of children from lead through a “whole of EPA” approach. By addressing lead reductions in the air, water, soil, in the homes, and other places where young children spend the most time, the strategy promises an agencywide result that is greater than the sum of its parts. EPA’s Strategy to Reduce Lead Exposures and Disparities in U.S. Communities warrants a more in depth and extensive analysis, including attention to its approach to environmental justice and its commitment to collaboration with federal and state agencies.

At the federal level, EPA’s discussion of collaboration makes sense. It shares responsibility to address the lead risks in the environment with several other federal actors. The Federal Aviation Administration, the Consumer Product Safety Commission, the Department of Health and Human Services, and the Department of Housing and Urban Development for example have significant roles to play in protecting children and others from harmful lead exposures. Future research examining actions by these and other agencies across the federal government would provide valuable insight into additional progress at the federal level. Commenters have frequently noted HUD’s shortcomings in protecting children in its own facilities, and news stories abound describing local housing authorities’ failures to meet state and federal requirements in protecting children in public housing—some of our children most at risk for elevated blood lead levels.

At the state level, best practices of primary prevention make important improvements in the health of children by reducing lead in their environments. The Howard University School of Law Fifty State Survey of Lead Protection Programs details the substantial investment in lead protection programs that some states have made. The goal of the survey is to provide activists and policymakers with information about the best practices seen in lead protection programs and how their states measure up. The goal of eliminating lead hazards from the environment remains firmly in place and attainable. History shows that progress toward it has come through incremental actions across a range of potential exposures and risks like those discussed above.²⁰⁵ As children’s blood lead levels have been lowered across the last several decades, continued scientific research has revealed that there is no safe level of lead in a child’s

205. *Id.*

blood.²⁰⁶ The thoughtful policymaking decisions of the past that resulted in the substantial reduction of average blood lead levels for children are also seen in the best state practices for primary prevention discussed above.²⁰⁷ Activists and state policymakers today who will replicate those thoughtful approaches to protecting children across the country's states and jurisdictions will continue that legacy of progress that bring us even closer to a lead-free future for children.

206. *Childhood Lead Poisoning Prevention: Overview of Childhood Lead Poisoning Prevention*, CENTERS FOR DISEASE CONTROL AND PREVENTION (Oct. 20, 2023), <https://www.cdc.gov/nceh/lead/overview.html> [<https://perma.cc/49TD-RHPX>].

207. Howard ECJC Fifty State Survey available with author.