



FEDERAL ACTION PLAN

To Reduce Childhood
Lead Exposures and
Associated Health Impacts

PRESIDENT'S TASK FORCE ON ENVIRONMENTAL
HEALTH RISKS AND SAFETY RISKS TO CHILDREN

DECEMBER 2018

EXECUTIVE SUMMARY

Lead exposure to children can result from multiple sources and can cause irreversible and life-long health effects. No safe blood lead level in children has been identified. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention and academic achievement.

The United States has made tremendous progress in lowering children's blood lead levels. As a result of multiple federal laws and regulations, including the 1973 phase out of lead in automobile gasoline, the 1978 federal regulation banning lead paint for residential and consumer use, and the 1995 ban on lead in solder in food cans, the median concentration of lead in the blood of children aged 1 to 5 years dropped from 15 micrograms per deciliter in 1976–1980 to 0.7 micrograms per deciliter in 2013–2014, a decrease of 95%. Although childhood blood lead levels have been substantially reduced as a result of these actions, some children are still exposed to high levels of lead. For example, non-Hispanic black children, children living in families below the federal poverty level and children living in older housing have statistically significant increased risk of higher blood lead levels (U.S. Environmental Protection Agency [EPA], 2017).

The Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts (Action Plan) is the product of the President's Task Force on Environmental Health Risks and Safety Risks to Children (Task Force). The Task Force is the focal point for federal collaboration to promote and protect children's environmental health. Established in 1997 by Executive Order 13045, the Task Force comprises 17 federal departments and offices. The Secretary of the Department of Health and Human Services (HHS) and the Administrator of the Environmental Protection Agency (EPA) co-chair the Task Force. The Senior Staff Steering Committee (Steering Committee) is its operational arm.

The *Action Plan* is a blueprint for reducing lead exposure and associated harms through collaboration among federal agencies with a range of stakeholders, including states, tribes and local communities, along with businesses, property owners and parents. The *Action Plan* will help federal agencies work strategically and collaboratively to reduce exposure to lead and improve children's health. It builds upon previous work of the Task Force to address lead exposure to children. In 2000, the Task Force published *Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead Paint Hazards* (Task Force, 2000), which focused on the largest lead source on average to children—lead paint in housing and adjacent soil. In 2016, the Task Force released *Key Federal Programs to Reduce Childhood Lead Exposures and Eliminate Associated Health Impacts* (Task Force, 2016), which describes the federal government's diverse efforts to further decrease lead exposure to children in the United States and mitigate adverse health impacts of lead.

This document promotes a vision that the United States will become a place where children, especially those in vulnerable communities, live, learn and play protected from lead exposure and its harmful effects. With a focus on populations disproportionately affected by lead exposure, the *Action Plan* strengthens federal efforts to implement Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (EPA, 1994). This Executive Order calls upon each federal agency “to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations.”

The Task Force obtained stakeholder input, including through presentations at public meetings, a listening session with tribal partners, an online survey on the Task Force website, a request for input through a *Federal Register* notice and focus groups with interested parties. Over 700 unique comments were received from a broad spectrum of stakeholders. Commenters included state, tribal and local governments, child advocacy organizations, environmental health advocates, medical providers, school and child care representatives, community-based organizations, industry representatives, tribal leaders and other members of the general public. The Task Force is committed to providing the public with updates regarding the progress of the federal agencies in accomplishing the actions described in this document.

The *Action Plan* has four goals with key priorities and objectives that seek to reduce harm to children from exposure to lead. By identifying specific goals and actions, federal agencies can prioritize their efforts and monitor progress.

The four goals are:

GOAL 1: Reduce Children’s Exposure to Lead Sources

GOAL 2: Identify Lead-Exposed Children and Improve Their Health Outcomes

GOAL 3: Communicate More Effectively with Stakeholders

GOAL 4: Support and Conduct Critical Research to Inform Efforts to Reduce Lead Exposures and Related Health Risks

The *Action Plan* is not a budget document and does not imply approval for any specific action under Executive Order 12866 or the Paperwork Reduction Act. It will inform future federal budget and regulatory development processes within the context of the goals articulated in the President’s Budget. All activities included in the *Action Plan* are subject to budgetary constraints, interagency processes, stakeholder input and other approvals, including the weighing of priorities and available resources by the Administration in formulating its annual budget and by Congress in legislating appropriations. In some cases, activities in the *Action Plan* require a sustained, multi-year effort by federal, state, tribal and community partners.

VISION

The United States will become a place where children, especially those in vulnerable communities, live, learn and play protected from the harmful effects of lead exposure.



INTRODUCTION

SCOPE

Lead exposure to children can result from multiple sources and can cause irreversible and life-long health effects. The *Action Plan* focuses on reducing exposures from lead sources and associated health impacts that present a serious and urgent threat to children, especially in high-risk communities.

The Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts (Action Plan) is a blueprint for reducing lead exposure through collaboration among federal agencies and with a range of stakeholders, including states, tribes and local communities, along with businesses, property owners and parents. The *Action Plan* will help federal agencies work strategically and collaboratively to reduce exposure to lead and improve children's health.

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The United States has made tremendous progress in lowering children's blood lead levels. As a result of multiple federal laws and regulations (EPA, 2017) including the 1973 phase out of lead in automobile gasoline, the 1978 federal regulation banning lead paint for residential and consumer use and the 1995 ban on lead in solder in food cans, the median concentration of lead in the blood of children aged 1 to 5 years dropped from 15 micrograms per deciliter ($\mu\text{g}/\text{dL}$) in 1976–1980 to 0.7 $\mu\text{g}/\text{dL}$ in 2013–2014, a decrease of 95%. The 95th percentile for blood lead among children aged 1 to 5 dropped from 29 $\mu\text{g}/\text{dL}$ in 1976–1980 to 2.2 $\mu\text{g}/\text{dL}$ during 2013–2014, a decrease of 92% (Task Force, 2016). Figure 1 depicts the timeline for major actions to prevent lead poisoning and the impact of these actions

on reductions in mean blood lead levels ($\mu\text{g}/\text{dL}$) among children aged 1 to 5 years from 1972 to 2012 (Centers for Disease Control and Prevention [CDC], n.d.).

Despite the overall decline of blood lead levels over time, lead exposure remains a significant public health concern for some children because of persistent lead hazards in the environment. Sources of lead include lead-based paint (Dewalt et al., 2015), lead service lines, lead in plumbing material and soil contaminated by historical sources (EPA, 2018a; EPA, 2018b). Children may also be exposed to lead through ingestion of contaminated food; use of folk-remedies, cultural products, and consumer products; recreational activities; and take-home exposures from workplaces (Lin et al., 2010; Shah et al., 2017; Task Force, 2016).

Lead exposure in children is measured by the concentration of lead in their blood. Between 1991 and 2012, children were identified as having a blood lead "level of concern" if the test result was 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) of lead in blood. However, the Centers for Disease Control and Prevention (CDC) no longer uses the term "level of concern" to describe children with elevated blood lead levels (CDC, 2017). Instead, based on the lack of scientific evidence for a safe blood lead level in children, CDC uses a population-based reference value to identify children with blood lead levels greater than 97.5% of the children aged 1 to 5 years (CDC, 2017). The blood lead reference value (BLRV) is not a clinical reference level defining an acceptable range of blood lead levels in children nor is it a health-based toxicity threshold; rather it is a policy tool that helps identify the children in the upper end of the population blood lead distribution in order to target prevention efforts and evaluate their effectiveness.

The current CDC BLRV is 5 $\mu\text{g}/\text{dL}$ based on the 97.5th percentile of the distribution of blood lead levels (BLLs) for children aged 1 to 5 years that was collected in the ongoing National Health and Nutrition Examination Survey (NHANES) during the 2007–2008 and 2009–2010 cycles (CDC, 2017). NHANES data from 2011–2014 show that in children aged 1 to 5 years, the estimated 97.5th percentile of blood lead

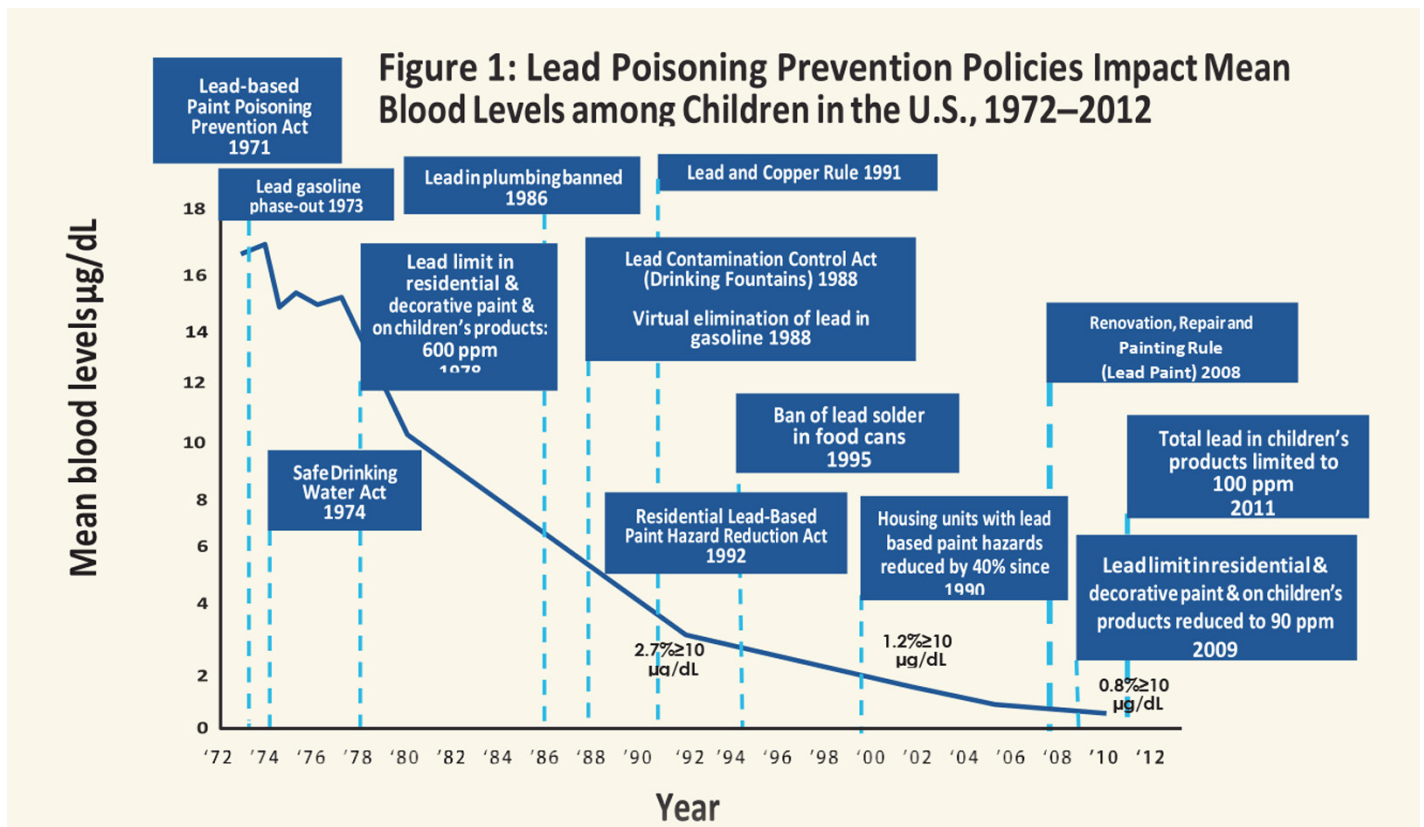


Figure 1: Source - Adapted from https://ptfkeh.niehs.nih.gov/features/assets/files/key_federal_programs_to_reduce_childhood_lead_exposures_and_eliminate_associated_health_impactspresidents_508.pdf and Brown MJ and Falk H. Toolkit for establishing laws to control the use of lead paint. Module C.iii. Conducting blood lead prevalence studies. Global Alliance to Eliminate Lead Paint (2017)

“Protecting children from exposure to lead is important to lifelong good health. No safe blood lead level in children has been identified. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement. And effects of lead exposure cannot be corrected.”

Centers for Disease Control and Prevention
 Source: https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm

level is 3.5 µg/dL (Caldwell et al., 2017). Accordingly, CDC is now evaluating whether to update its BLRV from 5 to 3.5 µg/dL.*

The risk for lead exposure is not the same for all children—data show disparities in exposure by sociodemographic characteristics and geographic location (Roberts et al., 2017; Hanna-Attisha et al., 2016; CDC, 2013; CDC, 2016). Furthermore, the relative contribution of various exposure media

(e.g., house dust, soil, drinking water, food, air) to BLLs can vary by childhood age and between those children with elevated BLLs versus lower BLLs (Zartarian et al., 2017). Analysis of NHANES data identified important risk factors for elevated BLLs in U.S. children including: race/ethnicity (non-Hispanic Black), housing age (pre-1946 and pre-1973), and poverty level (family income at or below poverty income ratio) (Caldwell et al., 2017; CDC, n.d.). The U.S. Department of Housing and Urban Development’s (HUD’s) American Healthy Homes Survey data established important housing risk factors that are associated with a higher prevalence of lead-based paint hazards, including lower income households and children living in homes that do not receive government rental support (Dewalt et al., 2015).

Average blood lead levels remain increased among non-Hispanic black children when compared to Mexican-American and non-Hispanic white children

* On January 18, 2017, the CDC’s National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) Board of Scientific Counselors voted to recommend that NCEH/ATSDR lower the current BLRV of 5 µg/dL to 3.5 µg/dL.

(EPA, 2017; Advisory Committee on Childhood Lead Poisoning Prevention [ACCLPP], 2012). Non-Hispanic black children, children living in families below the poverty level and children living in older housing have a statistically significant increased risk of higher BLLs (EPA, 2017). For 2011–2014, the 95th percentile for lead in blood in families with incomes below the poverty level was 3.4 µg/dL, and among those in families at or above the poverty level it was 2.0 µg/dL (Caldwell et al., 2017; EPA, 2017).

Reducing exposure to lead and associated health impacts begins by identifying risk factors at the local level, improving the identification and monitoring of lead exposed children, and targeting services and resources to localities at greatest risk. In collaboration with partners (e.g., all levels of state, tribal and local government, the private sector, non-governmental organizations, philanthropies and community organizations), federal agencies, as part of their commitment to this *Action Plan*, will focus on tribal, environmental justice, and other communities where BLL disparities are most pronounced. In the context of the CDC’s conclusion that even low levels of lead exposure present a concern for young children and no safe level exists, the federal government has identified actions to further reduce exposures to lead

and associated health impacts, especially for those localities at greatest risk.

Actions to reduce exposures to lead fall under the following four interconnected goals. These goals are:

- **Goal 1: Reduce Children’s Exposure to Lead Sources**
- **Goal 2: Identify Lead-Exposed Children and Improve Their Health Outcomes**
- **Goal 3: Communicate More Effectively with Stakeholders**
- **Goal 4: Support and Conduct Critical Research to Inform Efforts to Reduce Lead Exposures and Related Health Risks**

Most actions are integrated from the federal level to regional offices, state, tribal and local governments, and community stakeholder groups so that the intended benefits reach target populations such as pre-school and low-income children and providers serving them, health educators, school officials, industrial workers and renovation contractors.



GOALS

Goal 1: Reduce Children's Exposure to Lead Sources

KEY PRIORITIES: Reduce children's exposure to lead-based paint, lead-contaminated drinking water and lead-contaminated soil.

IMPACT:

Federal efforts can further reduce childhood lead exposures by employing multiple coordinated approaches that include strengthening standards, enhancing prevention and control measures, and implementing long-lasting infrastructure improvements.

Objective 1.1. Reduce Children's Exposure in Homes and Child-Occupied Facilities with Lead-Based Paint Hazards

Reducing exposure to lead paint in old housing continues to offer the potential to significantly decrease blood lead levels in the largest number of children. It is important that a focus on structures include homes and locations outside the home where young children spend significant amounts of time, such as child care settings and schools (EPA, 2008).

Actions:

- Consider revisions, as appropriate, to the dust-lead hazard standards to address childhood exposures to lead-contaminated dust generated from lead-based paint. (EPA)
- Continue to implement regulations and other relevant authorities that require individuals and



Public lead outreach and education event.

firms conducting lead-based paint abatement, risk assessment or inspection to be properly trained and certified, training programs to be accredited, and these activities to be conducted according to reliable, effective and safe work practice standards. (EPA)

- Increase HUD review of federally assisted projects to assure individuals and firms conducting lead-based paint inspections and risk assessments, abatement and interim controls, are properly trained and certified to conduct such actions in federally assisted properties. (HUD)
- Increase the number (or percentage) of certified renovation firms capable of providing lead-safe renovation, repair and painting services through targeted outreach campaigns to contractors; continue to provide a nationwide list of certified renovation firms on the EPA's website. (EPA)
- Reduce lead exposure in rural housing by promoting the Lead Based Paint Compliance Key (<https://leadpaint.sc.egov.usda.gov/LBPWeb/lbpQuestionnaire>), an interactive internet program, to identify lead mitigation actions and by continuing to leverage loans for lead abatement activities. (USDA)
- Expand the targeting of residential lead hazard reduction programs to the highest risk homes and communities. (HUD)
- Expand direct collaboration with state, tribal and local governments on their development of lead paint hazard reduction strategies under their Consolidated Plans for community planning and development, program assistance and their lead hazard control grants. (HUD)
- Reduce post-disaster lead exposure from response- and recovery-phase renovations and repair for structures that are destroyed or significantly damaged. (HUD)

Objective 1.2. Reduce Exposure to Lead from Drinking Water

In 1991, the EPA promulgated the Lead and Copper Rule (LCR) under the Safe Drinking Water Act, to minimize lead and copper levels in drinking water.

Recognizing that no safe level of lead in drinking water had been identified, the LCR set a non-enforceable health-based maximum contaminant



level goal of zero for lead and requires a treatment technique to reduce lead levels to the extent feasible.

Under the LCR, water systems must work with their customers to collect tap samples from locations with lead service lines and/or leaded plumbing materials. The LCR requires water systems that are not able to limit lead levels below EPA's action level for lead in water of 15 µg/liter by optimizing corrosion treatment to replace service lines that are made of lead and conduct public education. Progress in reducing lead exposures has resulted, in part, from improving implementation of and compliance with the current LCR (EPA, 2018c).

Actions:

- Revise the LCR based on input EPA recently received from state, tribal and local partners, as well as the best available peer reviewed science, to ensure the rule reflects the best ways to improve public health protection and reduce levels of lead in drinking water. (EPA)
- Enhance implementation of the LCR by engaging with state, tribal, local and other stakeholders to identify implementation challenges, best practices and tools to address these challenges. (EPA)
- Assist schools and child care centers with the 3Ts approach (Training, Testing and Taking Action) to reduce lead in drinking water and increase the number of schools and child care centers that test and provide parents with information on how to minimize children's exposure to lead in drinking water. (EPA)
- Finalize regulatory changes to the definition of lead-free plumbing products and make other conforming

changes to implement the Reduction of Lead in Drinking Water Act and the Community Fire Safety Act enacted by Congress. The final regulation is expected to result in fewer sources of lead in drinking water by implementing new standards for lead content in plumbing materials used in new installations and repairs. (EPA)

- Collaborate with states and tribes to provide opportunities for low-interest loans and grants through the Drinking Water State Revolving Fund and the Water Infrastructure Finance and Innovation Act loan program for updating and replacing drinking water infrastructure. (EPA)
- Implement three newly authorized grant programs under the Water Infrastructure Improvements for the Nation Act, for which Congress appropriated \$50 million in FY2018, to fund grants to small and disadvantaged communities for developing and maintaining infrastructure, for lead reduction projects, and to support the voluntary testing of drinking water in schools and child care centers. These programs decrease exposure to lead in drinking water by providing financial incentives to test, educate and replace infrastructure. (EPA)
- Provide low-interest loans and grants to rural communities for drinking water infrastructure. (USDA)



Soil cleanup on a residential property.

Objective 1.3. Reduce Exposure to Lead in Soil

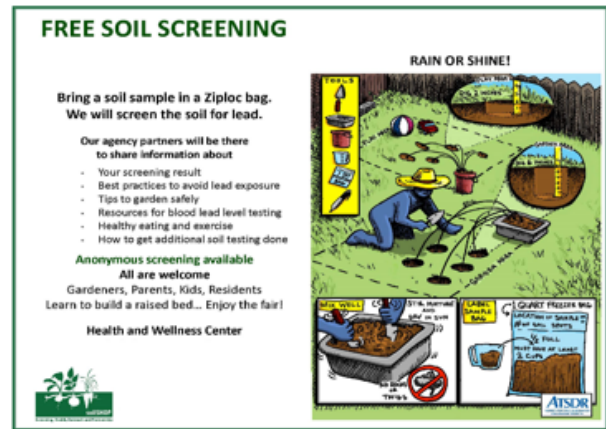
Lead can be a relatively common soil contaminant as a result of past and current human activity or uses (i.e., lead paint deposited in surface soil), and natural occurrence (ATSDR, 2017; EPA, 2017). Young children often have higher rates of soil and dust ingestion because of their unique behaviors such as crawling and hand/object-to-mouth contact (Task Force, 2016). As such, children who play in areas near former mining and smelting sites,

manufacturing facilities, processing plants, landfills, and buildings with exterior lead-based paint may be exposed through incidental ingestion of small amounts of soil or soil-derived indoor dust (ATSDR, 2017). Soil near roadways (Mielke et al., 2013) and in yards, playgrounds, gardens and elsewhere in the community may also be a source of exposure. Contaminated soil can also be tracked into the home.

Progress has been made to ensure community residents are better protected, informed and involved in site cleanup decisions. EPA actions to reduce childhood exposure from lead in soil include: managing lead contamination at Superfund, Resource Conservation and Recovery Act (RCRA) Corrective Action and other sites through removal, remedial and corrective actions; sponsoring lead education events in communities that include offering free testing of soil from residential yards and gardens and blood lead testing for children; updating the Superfund Lead-Contaminated Residential Sites Handbook; and offering technical assistance to brownfield communities to identify best management practices and potential funding opportunities.

Actions:

- Manage lead contamination at Superfund, RCRA Corrective Action and other sites to reduce exposure to community residents. (EPA; HHS/ATSDR)
- Continue to reduce childhood exposures to lead in soils through removal, remedial and corrective actions at contaminated sites and reduce lead soil exposures to the most sensitive community residents. (EPA)
- Expand the use of Soil Screening, Health, Outreach and Partnership (SoilSHOP) health education events to inform community members about the lead content of the soil in their immediate environments and best practices for safer gardening and prevention of childhood lead exposure. (HHS/ATSDR)
- Continue to support the evaluation of lead exposure at contaminated sites and identify ways to protect the public’s health. (HHS/ATSDR; EPA)



Other Objectives: Addressing other sources of lead and enforcing and providing compliance assistance with the laws aimed at reducing lead exposures will further reduce exposures.

Objective 1.4. Reduce Exposure to Lead Associated with Emissions to Ambient Air

As a result of several regulatory actions over the past two decades, lead emissions in air have substantially declined (EPA, 2014a; EPA, 2014b; Task Force, 2016; EPA, 2018d). However, lead is still emitted into ambient air from a variety of sources, including metals processing facilities and combustion of leaded aviation fuel (avgas) by aircraft with piston engines (EPA, 2014a; Task Force, 2016). Currently, the source category with the greatest contribution to total U.S. air emissions is piston-engine aircraft operating on leaded fuel (EPA, 2018d; Task Force, 2016). The highest air concentrations in individual locations are currently found near secondary lead smelting operations, such as battery recycling facilities and other metal processing facilities (EPA, 2014a; Task Force, 2016). As detailed below, federal agencies are taking several steps to assess and manage lead emissions from these sources.

Actions:

- Continue to work with state and tribal air agencies to implement the National Ambient Air Quality Standard (NAAQS) for lead and aim to reduce the number of areas violating the lead NAAQS. (EPA; HHS)
- Evaluate the impacts of lead emissions from aircraft using leaded aviation fuel under the Clean Air Act. (EPA)
- Conduct a research and development program for evaluating unleaded aviation fuels through the Piston Aviation Fuel Initiative. (Department of Transportation (DOT)/Federal Aviation Administration (FAA))



Soil cleanup of a Superfund site.

Objective 1.5. Reduce Lead Exposure from Occupational Sources

The Occupational Safety and Health Administration (OSHA) enforces workplace standards for lead that include a permissible exposure limit for workers' exposure to airborne lead and temporary medical removal protection provisions for workers with elevated blood lead levels, in addition to other requirements. OSHA is exploring regulatory options to lower blood lead levels in affected workers.

Actions:

- Publish an Advanced Notice of Proposed Rulemaking to seek input from the public on possible areas of the lead standards for revision to improve protection of workers in industries and occupations where preventable exposure to lead continues to occur. Children may be exposed to lead if their parents or other adults in the household transfer lead from the workplace to their home or vehicle. (Department of Labor (DOL)/OSHA)
- Reduce occupational exposure to lead, including take-home exposure to children, by incorporating information on such hazards and how to avoid them into training courses/materials developed and conducted by the National Institutes of Health's (NIH) National Institute of Environmental Health Sciences (NIEHS) Worker Training Program. (HHS/ NIEHS)

Objective 1.6. Reduce Exposure to Lead in Food

To assess the risk of lead in food, the FDA currently uses an interim reference level of 3 micrograms per day to assess the risk of lead in food for children. Following good agricultural and manufacturing practices can minimize lead contamination of foods.

Actions:

- Reevaluate the provisional tolerable total dietary intake level as a tool for assessing risk linked to exposure to lead in any particular food. (HHS/FDA)
- Consider increased monitoring of domestic and imported foods for lead. (HHS/FDA)
- Consider whether to establish maximum lead levels in foods by regulation or by guidance. (HHS/ FDA)
- Participate in decreasing the Codex Alimentarius General Standard for Contaminants and Toxins in Food and Feed's maximum levels for lead in food worldwide. (HHS/FDA)

Objective 1.7. Reduce Exposure to Lead in Cosmetics and Personal Care Products

Because of its background presence in the environment, lead may occur as an impurity in ingredients used in some cosmetic products.

Actions:

- Continue to monitor domestic and imported cosmetics for lead impurities. (HHS/FDA)
- Participate in international lead reduction efforts. (HHS/FDA)
- Monitor and post results of lead levels in cosmetic products, including tattoo inks, through FDA's survey activities. (HHS/FDA)
- Issue final guidance for a maximum lead level in cosmetic products. (HHS/FDA)



Objective 1.8. Reduce Exposure to Lead in Consumer Products

The Consumer Product Safety Commission (CPSC) limits total lead content of children's products and bans paints intended for consumer use, certain

furniture articles, children’s toys and other articles intended for use by children that bear lead-containing paint. CPSC requires that certain paints that are not banned must have cautionary labeling.

Actions:

- Continue to enforce regulations regarding lead content and lead paint limits for consumer products. (CPSC)
- Continue to enforce labeling requirements to prevent consumer product-related lead exposure. (CPSC)
- Work internationally to improve foreign suppliers’ compliance with U.S. lead-based paint and total lead content requirements. (CPSC)

Objective 1.9. Reduce Lead Exposure Through Enforcement and Compliance Assistance

Congress has given federal regulatory agencies and the Department of Justice (DOJ) authority to employ a wide range of options to assure compliance with and enforce the laws that help reduce the sources of lead in children’s environments. Options may include formal or informal administrative actions by the regulatory agency or judicial enforcement through a referral to DOJ for a civil enforcement action or criminal prosecution. EPA and HUD are the regulatory agencies that conduct administrative enforcement and provide compliance assistance for homes and child-occupied facilities with lead-based paint, lead-contaminated drinking water, and lead-contaminated soil.

DOJ supports the regulatory agencies’ focus on addressing lead exposures. DOJ is committed to the vigorous enforcement of the law and seeks to prioritize action on agency referrals of cases involving actual or potential childhood exposure to lead, particularly when these cases are time sensitive and require rapid action to protect human health.

The goals of DOJ’s civil enforcement actions are generally to require violators to come into compliance and take measures to stop ongoing violations, remedy harm to public health or the environment, remove the economic benefits of noncompliance, and punish and deter violations through civil penalties. Although less common, criminal enforcement is also a key component of the overall enforcement scheme. It deters subsequent violations through criminal penalties, including fines, imprisonment and probation, and provides restitution for crime victims.

DOJ will coordinate and collaborate with federal agencies, U.S. Attorneys’ offices and states and tribes to share information and develop enforcement cases. DOJ will also seek opportunities to provide training to attorneys bringing enforcement cases intended to reduce the sources of lead exposure to children.

Goal 2. Identify Lead-Exposed Children and Improve Their Health Outcomes

KEY PRIORITIES: Improve identification of children exposed to lead through surveillance of BLL data and foster access to services and support designed to improve children’s physical, developmental and mental health. Ideally, these services would be provided through a patient-centered medical home in a coordinated system of care.

IMPACT:

Expanding the federal government’s efforts to identify children in high-risk communities will target resources for interventions and services and improve health outcomes.

Objective 2.1. Improve Surveillance of Blood Lead Levels (BLLs) to Identify Children Exposed to Lead

Children can be given a blood test to measure the level of lead in their blood. These tests are covered by Medicaid, if the children are covered by Medicaid, and most private health insurance plans.

Actions:

- Evaluate updating the blood lead reference value. (HHS/CDC)
- Refine national health objectives (e.g., Healthy People objectives) for BLLs in children to focus on populations at highest risk for exposure. (HHS/ Office of the Assistant Secretary for Health)
- Explore ways to improve the utility of required blood testing of children enrolled in Medicaid and receiving services from the Supplemental Nutrition Program for Women, Infants, and Children (WIC). (HHS/Centers for Medicare & Medicaid Services (CMS)/CDC; USDA)

- Conduct targeted screening surveys and/or small-area prevalence studies to identify localities with high lead exposure risk. (HHS/CDC)
- Better understand childhood lead exposures through collaboration with tribal partners and identifying exposure scenarios; identify appropriate data, improve federal programs, services, and blood lead testing opportunities for Native American children. (HHS/Indian Health Service/CDC; EPA; HUD; USDA)

Objective 2.2: Facilitate Follow-up Blood Lead Testing and Monitoring of Children Identified as Lead-Exposed

A primary purpose of blood lead testing is to identify children with lead exposure before they show signs and symptoms and ensure that they promptly receive services to identify exposure pathways, reduce exposures, and reduce the potential impacts of lead exposure. State, tribal and local health agencies use blood lead test results above a designated public health action level to initiate lead investigations in the child’s home, once a child is identified as lead-exposed. Case management activities are initiated at varying blood lead “action” levels based on applicable jurisdictional laws and regulations, as well as available local resources.

Pediatric Environmental Health Specialty Units (PEHSUs), jointly funded by EPA and HHS/ATSDR, work with healthcare professionals, parents, schools and community groups, and with federal, state, tribal and local agencies to address children’s environmental health issues in homes, schools and communities. PEHSUs can facilitate training of health providers who serve lead-exposed children and their families.

Actions:

- Explore creative ways to work with state, tribal and local communities to match children identified as lead-exposed with local environmental assessment services and enhanced health services. (HUD; HHS/CDC/CMS)
- Support the efforts of the PEHSUs to increase the number of obstetricians, pediatricians and nurses with continuing education on prevention, diagnosis, management and treatment of lead exposure. (EPA; HHS/ATSDR)

Objective 2.3. Facilitate Screening for Developmental Delays in Children Identified as Lead-Exposed

Once a child is identified as at-risk for developmental delays because of lead exposure by state, tribal and local officials based on their criteria, assessment of the child’s developmental progress over time by healthcare providers facilitates early identification of any developmental delays.

Early identification of developmental delays allows providers and communities to intervene earlier to improve outcomes. Guidance co-sponsored by EPA and ATSDR through PEHSUs and the American Academy of Pediatrics (AAP) states that lead exposure should be viewed as a lifelong issue, rather than an acute exposure (Newman et al., 2013). Because children with elevated BLLs are at high risk for developmental problems, the AAP further recommends continued screening for developmental delays and mental, emotional and behavioral disorders in those children as they age (Newman et al., 2013).

Actions:

- Work across government and non-government agencies in communities where surveillance has identified children with higher BLLs. Encourage primary care and other providers to promote developmental monitoring by providing CDC’s “Learn the Signs. Act Early.” (LTSAE) materials (<https://www.cdc.gov/ncbddd/actearly/milestones/index.html>) to parents and other caregivers when a child under five years of age has documented lead exposure. (HHS/CDC/NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development)
- Link CDC’s LTSAE web materials, “Birth to Five: Watch Me Thrive!” and other child developmental monitoring information with CDC’s lead webpages and with at least two technical assistance and support webpages serving HHS early childhood grantees. (HHS/CDC)



Community health fair.

Objective 2.4. Facilitate Referrals and Receipt of Appropriate Services for Children Identified as At-Risk for Developmental Delays Due to Lead Exposure

Children with developmental delays or at high risk for developmental delays benefit most from interventions that start at an early age (HHS, 2015). Thus, timely identification and referral to services are critical. Increasing referrals to appropriate services could improve child and family outcomes beyond the cognitive and behavioral sequelae of lead exposure.

Family-to-Family Health Information Centers (F2F HICs) provide information, education, technical assistance and peer support to families of children and youth with special healthcare needs and the professionals who serve such families. F2F HICs are staffed by families with children and youth with special health needs.

The Maternal and Child Environmental Health Collaborative Improvement and Innovation Network supports coordinated systems of care in 10 states that will use a quality improvement framework and collaborative learning to improve coordination of the many services needed by lead-exposed children. Participating states will also develop or update a state action plan to decrease children's exposure to lead.

Actions:

- Facilitate the development of state action plans and improve access to coordinated systems of care for children exposed to lead in all states participating in the Maternal and Child Environmental Health Collaborative Improvement and Innovation Network. (HHS/Health Resources and Services Administration (HRSA))

- Provide one-on-one risk assessments and counseling to individuals concerning lead exposures and developmental milestones and provide resources related to lead exposures for families through the Maternal and Child Environmental Health Network. (HHS/HRSA)
- Provide training to F2F HICs on the implications of lead exposures and resources to support families who are exposed to lead. (HHS/HRSA)
- Provide PEHSUs and public health agencies in at least 25 states with information and resources about effective treatments for mental, emotional, behavioral and developmental disorders and developmental monitoring related to lead exposure. (EPA; HHS/ATSDR/CDC)



Goal 3: Communicate More Effectively with Stakeholders

KEY PRIORITIES: Improve public awareness of the dangers associated with lead exposure by consolidating and streamlining federal messaging on reducing exposures to lead.

IMPACT:

Communicating early and often with all stakeholders will assist state, tribal and local governments in their on-the-ground community-based efforts to reduce lead exposures in their communities and provide information for community members including parents.

Objective 3.1. Consolidate and Streamline Federal Lead-Related Communication and Messaging

To ensure that stakeholders receive consistent and accurate messages on lead, the Task Force will work collaboratively to expand federal communication efforts by leveraging existing partnerships and stakeholder relationships and develop a comprehensive and effective federal-wide communications and outreach plan for reducing exposures to lead.

Actions:

- Create an online portal to enhance, consolidate and streamline federal-wide communication to the public. Links will direct the public to agency-specific information. (Not everyone affected by lead exposures has access to the internet, and therefore, agencies will continue to provide access to printed materials.) (Steering Committee)
- Provide periodic updates on the progress of implementing the *Action Plan* on the online portal. (Steering Committee)
- Enhance local partnerships with community organizations, local health agencies, faith-based organizations and private philanthropies to raise awareness of the dangers of exposure to lead-based paint hazards, and to promote data sharing. (Steering Committee)

Objective 3.2. Improve Awareness of Lead Hazards, Prevention, and Remediation among Diverse Populations, Especially Those Most at Risk

As each community is diverse and deals with a variety of challenges, a one-size-fits-all approach is not effective at increasing prevention awareness. Therefore, it is imperative that outreach activities be designed specifically for diverse populations—especially racial and ethnic minorities, recent immigrants and limited English proficiency populations who are at highest risk of being exposed to lead—taking into account factors such as income, education, internet access, healthcare access, cultural and other considerations.

When developing outreach and education materials for various communities, the NIEHS/EPA Children’s Environmental Health and Disease Prevention Research Centers (“Children’s Centers”) and PEHSUs



Exhibit at a health fair.

can serve as important resources. In addition to conducting scientific studies on environmental health issues, each Children’s Center collaborates with various community partners and organizations to inform, advance and disseminate information for public health protection.

Actions:

- Utilize the Children’s Centers and PEHSUs to develop appropriate, evidence-based lead exposure prevention and intervention communication materials and disseminate them through the Centers’ established community partnerships. (Steering Committee)
- Enhance partnerships with state, tribal and local governments, and key stakeholders (e.g., media, community groups, faith-based groups, advocacy groups, departments of health, departments of environmental quality, medical providers, philanthropies, federal grantees and others) that represent or serve communities at risk for childhood lead exposure. (Steering Committee)
- Increase outreach events and engagement processes in collaboration with at-risk communities and lead-safe coalitions to provide education on the dangers of lead exposures, strategies for reducing exposures in children, and actions to support exposed children and their families. (Steering Committee)

Goal 4: Support and Conduct Critical Research to Inform Efforts to Reduce Lead Exposures and Related Health Risks

Building on past and current lead research, this goal focuses on addressing critical information gaps, identifying and eliminating duplication of efforts and maximizing leveraging and coordination opportunities. Because of disparities in BLLs and because lead sources vary by location (CDC, 2016) and relative exposure pathway, approaches are needed to evaluate the contributions of multimedia lead exposures and identify risk factors at the local level (Zartarian et al., 2017). Childhood lead exposure is a multifaceted, multimedia issue with critical information and data gaps remaining. Research efforts through cross-agency collaborations are needed to address key information gaps for identifying children at highest risk, and understanding, preventing, and mitigating lead exposure and related health effects.

KEY PRIORITIES: Prioritize and address the critical research and data needs to inform lead policies and guide decisions.

IMPACT:

Advance scientific understanding of multimedia lead exposures and their relationship to BLLs, and improve/provide data, tools, methods, and technologies for targeting effective prevention and mitigation solutions.

Objective 4.1. The majority of the research to address the actions identified under this goal is expected to be implemented by EPA, HHS and HUD; other agencies will also conduct lead-focused research, as needed, to support their missions.

Actions:

- Enhance and apply data and tools (e.g., models or approaches) and determine the key drivers of blood lead levels from multimedia exposures to inform lead regulatory decisions and site assessments. (Informs Goals 1, 2)



- Generate data, maps and mapping tools to identify high exposure communities or locations and disparities for prioritization efforts to reduce children's blood lead levels. (Informs Goals 1, 2, 3)
- Generate data to address critical gaps for reducing uncertainty in lead modeling and mapping for exposure/risk analyses and for estimating population-wide health benefits of actions to reduce lead exposures. (Informs Goals 1, 2, 3)
- Identify approaches to prevent, mitigate, and communicate about lead exposures and risks in exposed communities. (Informs Goals 1, 2, 3)
- Evaluate the effectiveness of actions (e.g., interventions, programs, policies, enforcement) to prevent lead exposure, mitigate health effects and communicate on lead exposures/risks. (Informs Goals 1, 2, 3)

Implementing the actions in Objective 4.1 will require effective collaboration among the federal agencies. An interagency workgroup is working to further define, prioritize and address the critical research needs. The outcomes are expected to inform lead policies and guide decisions through the application of tools, data, information, and approaches, and identification of the most effective public health practices to reduce children's lead exposures and its health impact. Prioritizing, leveraging and coordinating lead research among agencies will identify opportunities to increase the value of individual agency efforts, while remaining cognizant of the different missions, capabilities and resources of the various federal agencies.

Objective 4.2. Establish the Lead Exposure and Prevention Advisory Committee (LEPAC). The Water Infrastructure Improvements for the Nation Act requires HHS to establish LEPAC as a federal advisory committee. It will review research and federal programs and services and identify effective services and best practices for addressing and preventing lead exposure and its impacts in affected communities.

Action:

- Establish, convene and support the work of the LEPAC. (HHS/CDC/ATSDR)

APPENDIX I: ACKNOWLEDGEMENTS

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- Goal 2: Adrienne Ettinger (HHS); Sharunda Buchanan (HHS); Jennifer Kaminski (HHS); Ann Ferrero (HHS); and Joan Scott (HHS)
- Goal 3: Angela Hackel (EPA) and Sharon Ricks (HHS)
- Goal 4: Valerie Zartarian (EPA); Suril Mehta (HHS) and Peter Ashley (HUD)

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APPENDIX II: LIST OF ACRONYMS

AAP	American Academy of Pediatrics
ATSDR	Agency for Toxic Substances and Disease Registry
BLL	Blood Lead Levels
BLRV	Blood Lead Reference Value
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare & Medicaid Services
CPSC	U.S. Consumer Product Safety Commission
DOJ	U.S. Department of Justice
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FDA	U.S. Food and Drug Administration
F2F HIC	Family-to-Family Health Information Center
HHS	U.S. Department of Health and Human Services
HRSA	U.S. Health Resources and Services Administration
HUD	U.S. Department of Housing and Urban Development
LCR	Lead and Copper Rule
LEPAC	Lead Exposure and Prevention Advisory Committee
LTSAE	CDC's "Learn the Signs. Act Early." Program
NAAQS	National Ambient Air Quality Standard
NCEH	National Center for Environmental Health
NHANES	National Health and Nutrition Examination Survey
NIEHS	National Institute of Environmental Health Sciences
OSHA	Occupational Safety and Health Administration
PEHSU	Pediatric Environmental Health Specialty Unit
RCRA	Resource Conservation and Recovery Act
SoilSHOP	Soil Screening, Health, Outreach and Partnership
USDA	U.S. Department of Agriculture

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U.S. Consumer Product Safety Commission www.cpsc.gov

U.S. Department of Agriculture www.usda.gov

U.S. Department of Education www.ed.gov

U.S. Department of Energy www.energy.gov

U.S. Department of Health and Human Services www.hhs.gov

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