President's Task Force on Environmental Health Risks and Safety Risks to Children

November 2016

Key Federal Programs to Reduce Childhood Lead Exposures and Eliminate Associated Health Impacts

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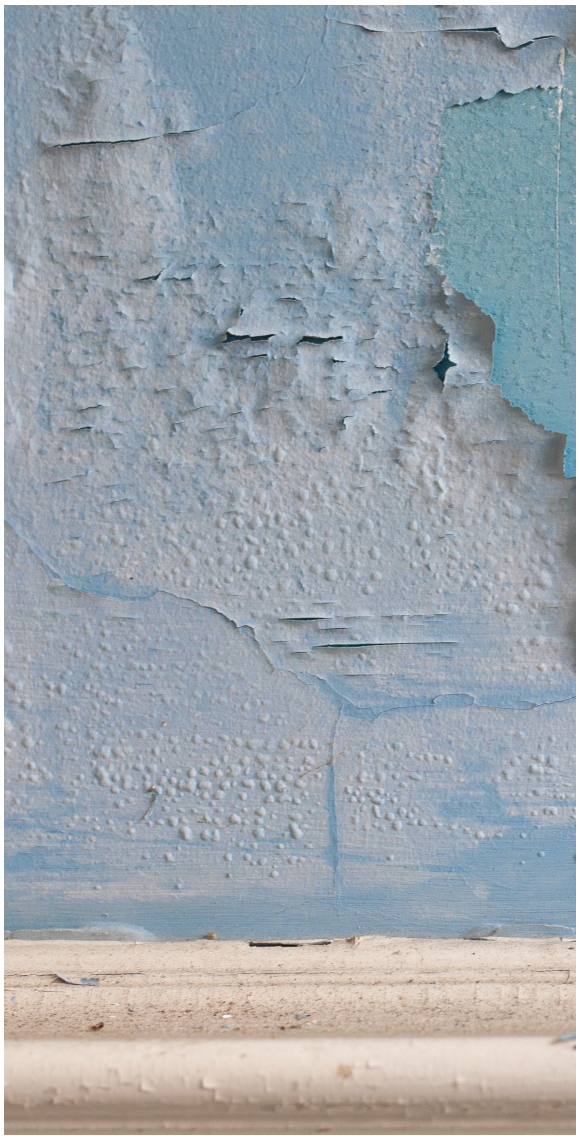
EXECUTIVE SUMMARY

Lead exposure has been linked to a number of health effects in children. The United States has made tremendous progress in reducing lead exposure, resulting in lower childhood blood lead levels over time. This progress has resulted, in part, from the enforcement of multiple U.S. regulations and implementation of numerous federal programs that aim to reduce childhood lead exposures or ameliorate its effects.

Today, about 3.6 million U.S. families with a child under age 6 years live in a home with one or more conditions that can expose their child to levels of lead that the U.S. Environmental Protection Agency (EPA) considers hazardous. The Centers for Disease Control and Prevention (CDC) uses a reference level of 5 micrograms of lead per deciliter of blood (µg/dL) to identify children whose blood lead levels are much higher than most children's levels and recommend initiation of public health actions. Approximately 500,000 children ages 1 to 5 years exceed the reference level, which is based on the U.S. population of children ages 1 to 5 years who are in the highest 2.5% of children when tested for lead in their blood. However, no safe blood lead level in children has been identified.



The federal government's actions to decrease lead exposure to children in the United States are diverse, and span nine federal agencies and departments. This report, *Key Federal Programs to Reduce Childhood Lead Exposures and Eliminate Associated Health Impacts*, was compiled by the President's Task Force on Environmental Health Risks and Safety Risks to Children (Task Force), which was established in 1997 by Executive Order 13045. In 2000, the Task Force published *Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead Paint Hazards* (Strategy). The Strategy put forward a set of recommendations aimed at eliminating childhood lead poisoning in the United States as a major public health problem by the year 2010. It focused primarily on expanding efforts to correct lead paint hazards (especially in low-income housing), which continues to be a major source of lead exposure for children.

However, it is clear that addressing lead exposures in the United States requires consideration of sources of lead exposure beyond that of lead paint to include, among others, drinking water, soil and consumer products.

Reviewing federal efforts that address multiple sources of lead exposure in children is a renewed priority for the Task Force.

This report includes the following:

- Current data on the blood lead levels of children in the United States;
- Known sources of childhood lead exposures;
- Associated effects on the health and well-being of children;
- The effectiveness of primary prevention and intervention measures; and
- The current status of efforts by nine federal agencies to address lead – the Consumer Product Safety Commission (CPSC), the Department of Agriculture (USDA), the Department of Education (ED), the Department of Health & Human Services (HHS), the Department of Housing and Urban Development (HUD), the Department of Justice (DOJ), the Department of Labor (DOL), the Department of Transportation (DOT), and the EPA.

Federal efforts include a wide range of activities such as research, surveillance, regulation and enforcement, and funding for community interventions and educational outreach. Most activities are integrated from the federal level to regional offices, state and local governments, and community stakeholder groups so that the intended benefits can reach target populations such as pre-school and low-income children, health educators, school officials, early care and education providers, industrial workers and renovation contractors. Even though the activities identified in this report are in many ways comprehensive and effective, improvements are still needed as elevated blood lead levels continue to persist in a small percentage of young children.

Furthermore, children are not exposed equally to lead, nor suffer its consequences in the same way. These disparities unduly burden minority families and low-income families and their communities.

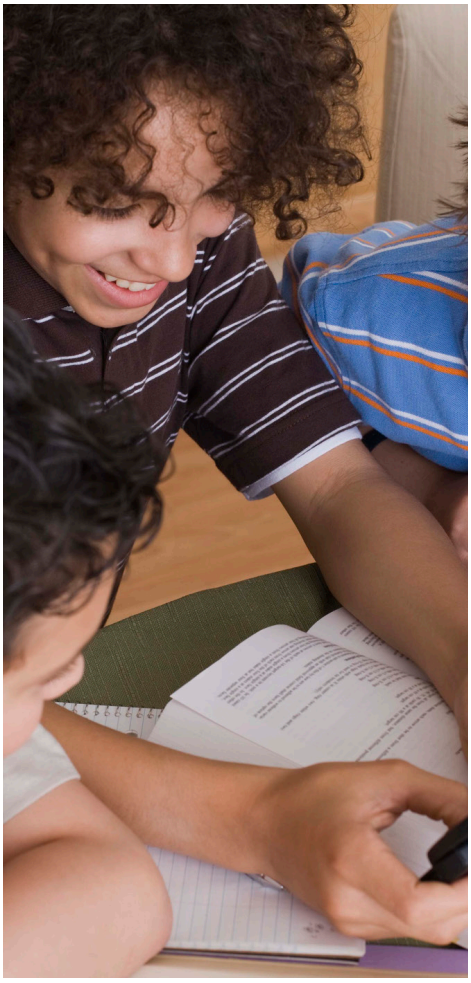
This report brings together, for the first time, descriptions of federal efforts currently planned or underway to address all sources of lead exposure in children. This report is a step toward a renewed collaborative effort to address lead exposures in children in the United States, and it provides a basis for the development of a new strategy to further reduce childhood lead exposure.

SECTION 1:
Background

Executive Order 13045, issued in 1997,[1] established the President's Task Force on Environmental Health Risks and Safety Risks to Children (Task Force). The Secretary of HHS and the Administrator of the EPA co-chair the Task Force, which comprises representatives of 17 federal departments and agencies and White House offices. It is charged with the following:

- Identifying priority issues of environmental health and safety risks to children that are best addressed through interagency efforts;
- Developing strategies to protect children's environmental health and safety;
- Recommending and implementing interagency actions; and
- Communicating information to federal, state and local decision makers for use in protecting children from environmental health and safety risks.

In 2000, the Task Force published *Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead Paint Hazards* (Strategy).[2] The Strategy put forward a set of recommendations aimed at eliminating childhood lead poisoning in the United States. It focused primarily on expanding efforts to correct lead-paint hazards (especially in low-income housing), a major source of lead exposure for children. Although children's blood lead levels have fallen significantly on a national level since the publication of the Strategy, exposures to lead, particularly lead paint and dust from lead paint in older houses, still pose risks to the health and well-being of America's children. Further, it is clear that addressing lead exposures in the United States requires consideration of sources of lead exposure beyond that of lead paint to include, among others, drinking water and consumer products. Recent revelations of lead exposure to children — in Flint, Michigan through drinking water and to children in East Chicago, Indiana through contaminated soil and lead dust from past industrial activities — demonstrate that children are not exposed equally to lead, nor suffer its consequences in the same way. These disparities unduly burden minority families and low-income families and their communities. Addressing these exposures is a matter of environmental justice.



Bringing together federal efforts that address multiple sources of lead exposure in children is a renewed priority for the Task Force.

SECTION 2:
Blood Lead Levels, Health Effects and Sources of Exposures

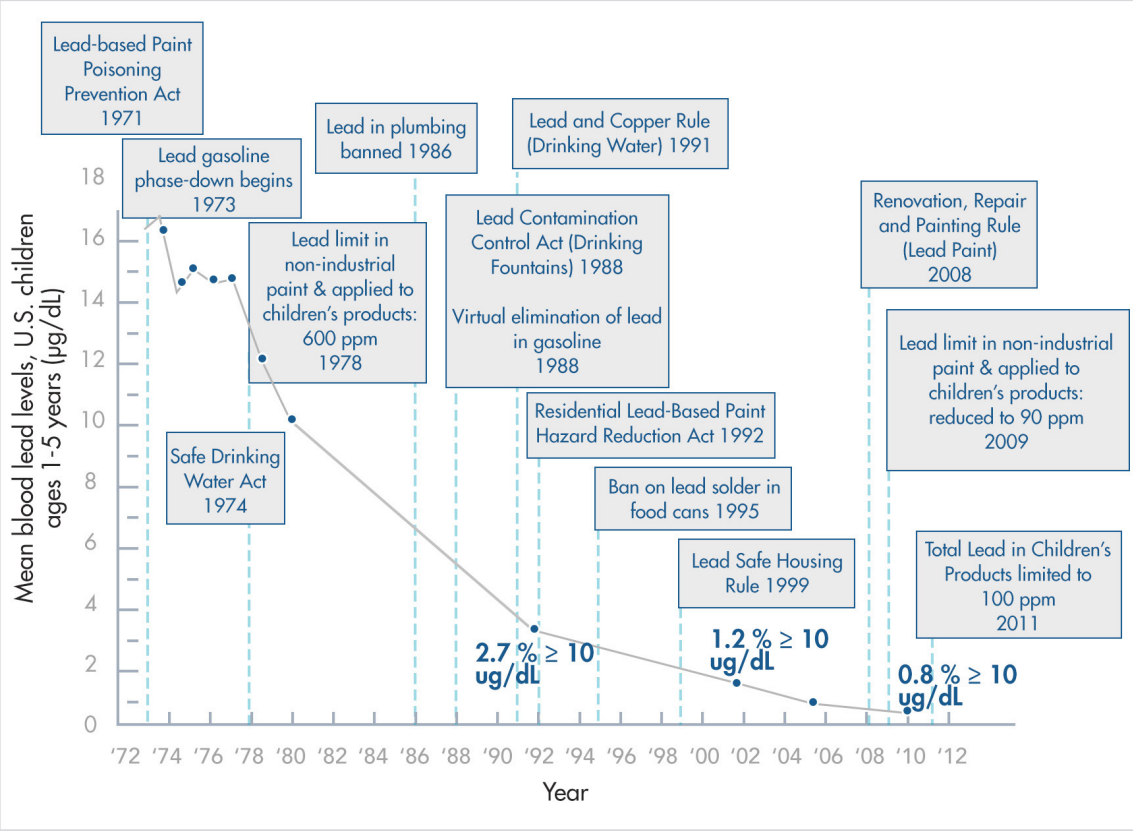
CHILDREN'S BLOOD LEAD LEVELS

The United States has made tremendous progress in reducing lead exposure, resulting in lower childhood blood lead levels over time. This progress has resulted, in part, from the existence, implementation, training and enforcement of multiple U.S. laws and regulations that aim to reduce childhood lead exposures. Regulations are issued by agencies as part of implementing the laws covering their programs. Figure 1 shows the impact of laws and regulations on the blood lead levels of children aged 1 to 5 years from 1972–2012.

The largest declines in blood lead levels occurred from the 1970s to the 1990s following the elimination of lead in motor-vehicle gasoline, the ban on lead paint for residential use, removal of lead from solder in food cans, bans on the use of lead pipes and plumbing fixtures and other limitations on the uses of lead (Figure 1). Declines in childhood blood lead levels have continued through 2013–2014.[11]

FIGURE 1

Lead poisoning prevention policies have reduced population blood levels



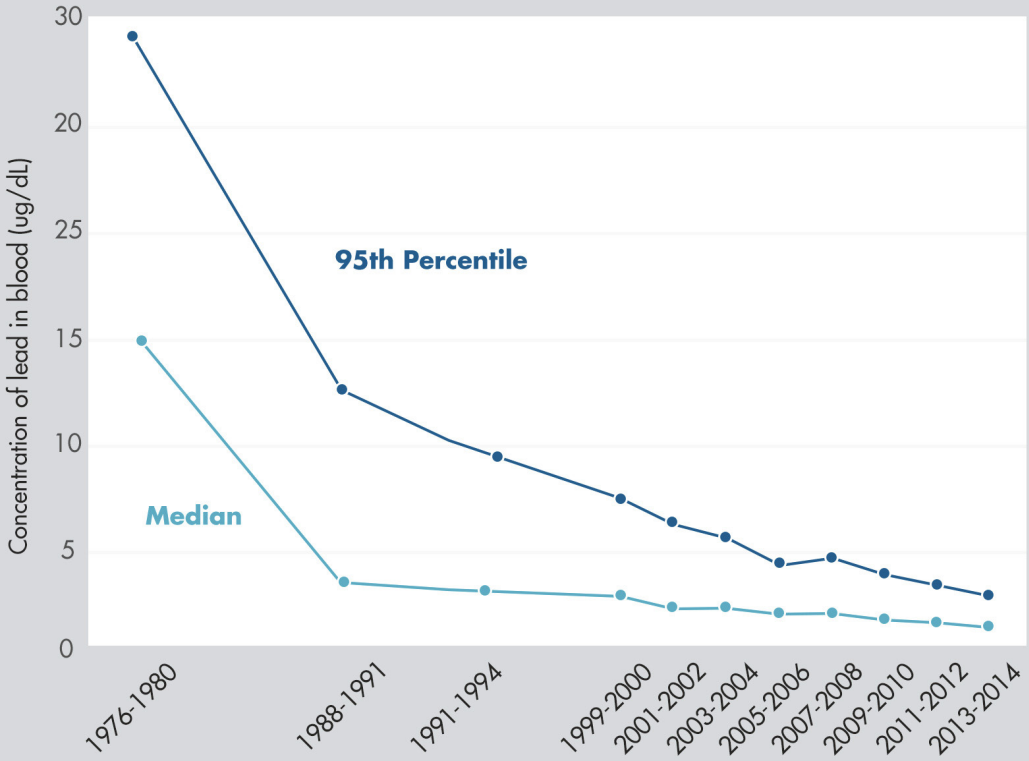
Source: Brown MJ and Falk H. Toolkit for establishing laws to control the use of lead paint. Module C.iii. Conducting blood lead prevalence studies. Global Alliance to Eliminate Lead Paint (2016).

According to the Centers for Disease Control and Prevention (CDC) National Health and Nutrition Examination Survey (NHANES), a population-based survey to assess the health and nutritional status of adults and children in the United States and to determine the prevalence of major diseases and associated risk factors, as well as the EPA *America's Children and the Environment* report, the median concentration of lead in the blood of children ages 1 to 5 years dropped from 15 µg/dL in 1976–1980 to 0.7 µg/dL in 2013–2014, a decrease of 95 percent (Figure 2).[11,8] The concentration of lead in blood at the 95th percentile in children ages 1 to 5 years dropped from 28 µg/dL in 1976–1980 to 2.2 µg/dL in 2013–2014, a decrease of 92 percent.[8, 11]

Despite the continued decline of blood lead levels in children, lead exposure remains a significant health concern for children. Today, about 3.6 million U.S. families with a child under age 6 years live in a home with one or more conditions that can expose their child to levels of lead that the EPA considers hazardous.[4]

FIGURE 2

Lead in U.S. children ages 1 to 5 years: Median and 95th percentile concentrations in blood, 1976-2014



Data: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

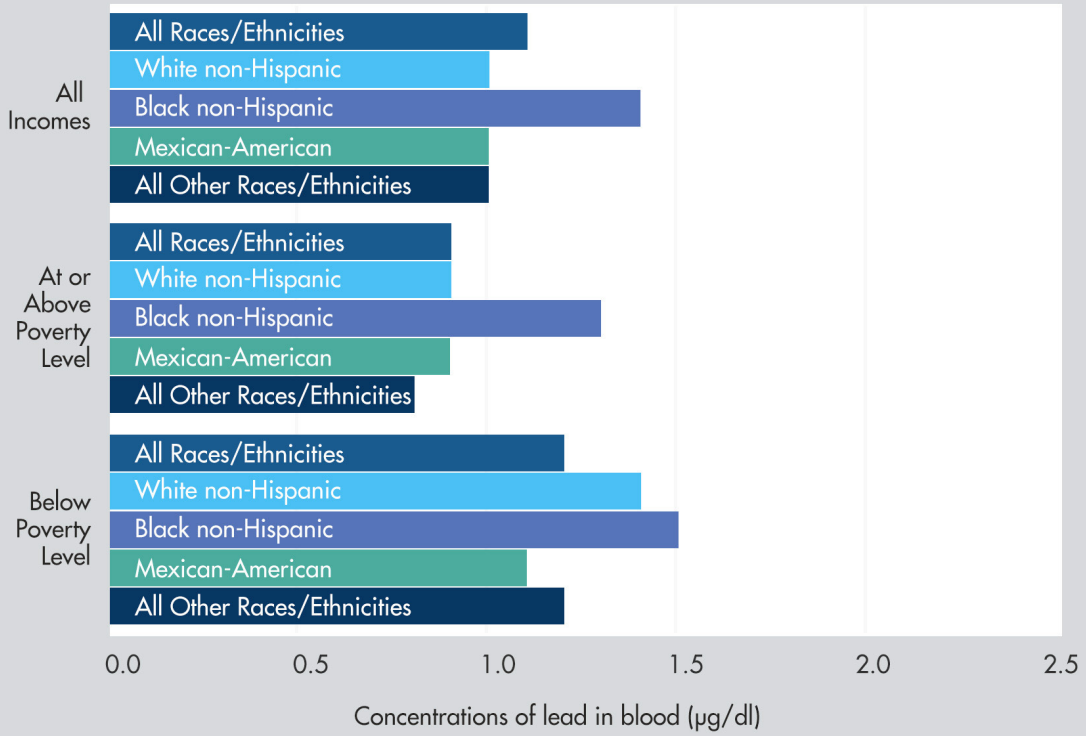
https://www.epa.gov/ace/biomonitoring-lead

There are approximately 500,000 children ages 1 to 5 years with blood lead levels at or above 5 µg/dL, the reference level at which the CDC currently recommends public health actions be initiated. Childhood lead exposures associated with harmful effects persist. Primary prevention, which addresses conditions that cause exposure before a child is exposed, is still the best strategy to protect children. This is in contrast to secondary prevention, which is the identification and management of individual cases after exposures have already caused elevated blood lead levels.

Lead exposure is not equal for all children – national data suggest disparities exist by race/ethnicity and income, as illustrated by Figure 3. Average blood lead levels remain higher among non-Hispanic black children when compared to Mexican-American and non-Hispanic white children.[11] Non-Hispanic black children, children living in families below the poverty level[12] and children living in older housing have significantly higher risk for higher blood lead levels.[11] Based on data from 2009–2012, children ages 1 to 5 years in families with incomes below poverty level had a 95th-percentile blood lead level of 4.3 µg/dL, which was significantly higher than similarly aged children among families at or above the poverty level (2.6 µg/dL).[11]

FIGURE 3

Lead in U.S. children ages 1 to 5 years: Median concentrations in blood, by race/ethnicity and family income, 2009-2012



Data: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

EPA. America's Children and the Environment, Third Edition, Updated February 2016
https://www.epa.gov/ace/biomonitoring-lead

These disparities unduly burden minority families and low-income families, as well as their communities. In response to Executive Order 12898, federal agencies must achieve environmental justice in minority populations and low-income populations, as part of their missions. This would include addressing the disproportionate effects of lead exposure.[13] The activities of the Task Force member agencies help fulfill this federal environmental justice responsibility.

REFERENCE LEVEL

Until 2012, children under age 6 years were identified by the CDC as having a blood lead "level of concern" if the test result was greater than or equal to 10 µg/dL of lead in blood. The CDC no longer uses the term "level of concern," but, as of mid-2016, began to use a reference level of 5 µg/dL of lead in blood to identify children with blood lead levels that indicate an elevated source of exposure in the child's environment.[9,10]

The 5 µg/dL reference level is based on the 97.5th percentile of the NHANES results for blood lead distribution in U.S. children ages 1 to 5 years. However, no safe blood lead level in children has been identified. The reference level as of the publication of this report is based on NHANES data from 2007–2008 and 2009–2010. As part of its four-year review cycle for the reference level, the CDC is analyzing the 2011–2012 and 2013–2014 sets of NHANES data to identify the 97.5th percentile of blood lead distribution in children. Once that figure is calculated, the CDC will determine whether to update the reference level.

In the past, blood lead results below 10 µg/dL may or may not have been reported to parents by healthcare providers or clinics because the results were below the CDC's "level of concern." The new lower value means that more children will likely be identified as having lead exposure, prompting mandatory reporting and thus allowing parents, doctors, public health officials and communities to take action earlier to intervene to mitigate effects and to reduce affected children's future exposure to lead.

HEALTH EFFECTS OF LEAD

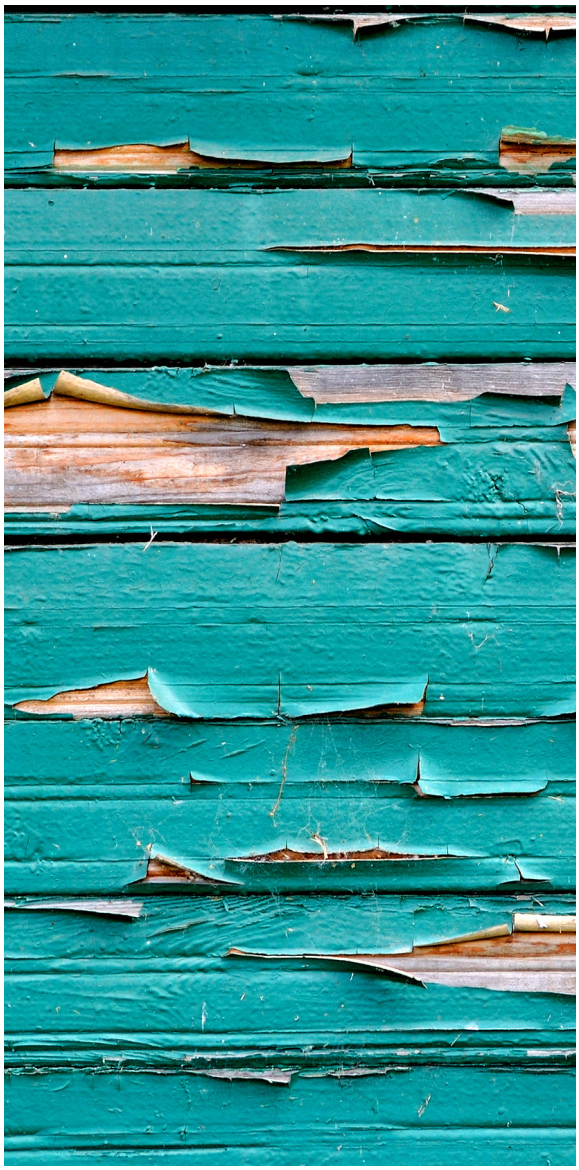
Lead exposure has been linked to a number of health effects in children (Table 1). Generally, higher levels of lead in the body are associated with a higher incidence and severity of health effects. For example, extremely high blood lead levels (greater than 80 µg/dL) can induce convulsions and cause loss of muscle control and even death. Very high blood lead levels (greater than 40 µg/dL) are associated with severe health effects, some with observable symptoms including abdominal pain, vomiting, anorexia, constipation and colic. Even at significantly lower levels of exposure, there can be serious consequences for children. Blood lead levels less than 10 µg/dL are associated with increases in behavioral effects and decreases in hearing, cognitive function and postnatal growth. Some levels in children at least 8 years old are associated with delayed puberty. Some of the same health effects are associated with even lower blood lead levels (less than 5 µg/dL) including decreased cognitive function (lower IQ scores, decreased academic achievement) and increased behavioral effects (behavioral problems and attention-related behaviors).[6,8] Limited evidence also suggests that blood lead levels less than 5 µg/dL may be associated with additional health effects, such as reduced kidney function in children at least 12 years of age and delayed puberty.[5,6,9] The National Toxicology Program's *Monograph on the Health Effects of Low-Level Lead*, Table 1.2, and the EPA's *Integrated Science Assessment for Lead*, Table ES-1, provide detailed listings of health effects of lead in children.[5,9]

Table 1. Summary of children's health effects by blood lead level (µg/dL)[9,10]

This table lists the major health effects with the strongest evidence and the blood lead level for which the highest-confidence conclusion has been reached, i.e., causal relationship (EPA, 2013) or sufficient evidence (NTP, 2012) of health effect. There are additional conclusions suggestive of a causal relationship (EPA, 2013) or limited evidence (NTP, 2012) for some of these effects and others at lower blood lead levels (see EPA, 2013; NTP, 2012; ATSDR, 2007 for additional details).[5,6,7]

Blood Lead Level	Sufficient Evidence or Causal Determination of Children's Health Effects
Below 5 µg/dL	Nervous System Effects: ▌ Cognitive function: Decreases in IQ, academic achievement, specific cognitive measures ▌ Externalizing behaviors: Increased incidence of attention-related and problem behaviors
Below 10 µg/dL	Effects listed above PLUS Nervous System Effects: ▌ Auditory function: decreased hearing Reproductive and Developmental Effects: ▌ Reduced postnatal growth ▌ Delayed puberty for girls and boys
10-40 µg/dL	Effects listed above PLUS Nervous System Effects: ▌ Nerve function: slower nerve conduction Blood Effects: ▌ Decreased hemoglobin, anemia
40-80 µg/dL	Effects listed above PLUS Gastrointestinal Effects: ▌ Abdominal pain, constipation, colic, anorexia and vomiting
Above 80 µg/dL	Effects listed above PLUS Nervous System Effects: ▌ Severe neural effects: convulsions, coma, loss of voluntary muscle control and death

SOURCES OF EXPOSURE



Primary prevention is still the best strategy to protect children from lead, and consideration of multiple sources of lead exposure is critical. It is important to recognize that there are multiple ways children can be exposed to lead that may differ by regions and households. While lead paint and dust may be the main source of exposure for many children, there are other sources that can result in higher blood lead levels. For example, based on case studies in Arizona, the CDC estimated that the source of lead in more than 30 percent of children with elevated blood lead levels could be attributed to non-paint sources such as folk remedies and pottery.[14] Lead may be found in air, water, soil, dust, food and consumer products. Lead and lead compounds from past human activities present the largest source of exposure to U.S. children. Infants and children are at greater risk of being exposed to lead because of their activity patterns, such as crawling, frequent hand-to-mouth activity and intentional ingestion of nonfood items, which is known as pica behavior. Also, for their size, children drink more and eat more compared to adults. For pregnant or lactating women exposed to lead, turnover of maternal bone releases accumulated lead into the blood, which may cross the placenta to the fetus or be secreted into breast milk.[3]

Elevated blood lead levels and even deaths have been associated with inadequately controlled sources, including ethnic remedies and goods, consumer products and food-related items such as ceramics used to serve food. Lead in public drinking water and in older urban centers remain exposure sources in many areas.

Common sources of lead exposure include the following:

Lead-based paint: A large source of lead exposure for children continues to be lead-containing dust and chips from deteriorating lead-based paint. Lead paint in old housing and buildings can break down over time, depositing in and around homes as dust and in soil. When lead-based paint is disturbed during a renovation, repair or painting activity, it can further create a lead hazard. The most recent national survey estimated that 37.1 million homes in the United States have lead-based paint, and 23.2 million homes have one or more significant lead-based paint hazards (i.e., significant amounts of deteriorated lead-based paint or elevated levels of lead in soil or house dust).[4]

- **Soil and yards:** Soil in yards, playgrounds and elsewhere in the community can be impacted from past and current sources, including exterior lead-based paint that chips and mixes with soil, former and current industrial releases to the atmosphere that contain lead, lead deposition from the air due to the former use of leaded gasoline or contaminated waste sites.
- **Water:** Lead can be found in groundwater and surface water surrounding certain industrial and mining areas, but is rarely found in drinking water at the source. Lead enters drinking water when leaded pipes, solder and plumbing fixtures corrode, as well as from corroded galvanized piping, due to inadequately or improperly treated water, especially where the water has high or low acidity or low mineral content.
- **Outdoor air:** Sources of lead emissions in the United States include ore and metal processing, leaded aviation fuel and other industrial sources. The highest air concentrations of lead are found near lead smelters.
- **Manufactured products:** Some products, including toys, cosmetics and jewelry may contain lead-based paint or lead in the materials.
- **Food:** Certain food and liquid containers, such as lead-glazed pottery or porcelain, may contain lead that can leach into food and liquids.
- **Hobbies and work exposure:** Occupational take-home exposures to lead (via work clothes) and hobbies/recreational activities involving lead can be sources of childhood lead exposure.

SECTION 3:
Protecting All Children

REDUCING THE HEALTH IMPACTS OF LEAD IN EXPOSED CHILDREN

The most effective way to avert the harmful effects of lead in children is through primary prevention, which aims to address conditions that cause exposure before a child is exposed. This includes lead-hazard control of a property via cleaning; maintenance and mitigation to address paint in housing; educational interventions, such as at-home visits; and measures to prevent the dispersal of lead in the environment, such as regulation and new technologies that decrease harmful uses of lead.

The significant number of children with blood lead levels associated with adverse effects makes it critically important to identify and, where found, promptly address the immediate and underlying causes of the elevated blood lead level and also treat lead-related cognitive and neurobehavioral effects.

Prevention requires the removal or reduction of lead in a child's environment before exposure occurs. Partnerships among federal, state and community programs are essential to ensure that primary prevention strategies are designed and implemented successfully.

While primary prevention is the desired outcome, secondary prevention is also needed because thousands of U.S. children already have elevated blood lead levels. Intervention for them is critical. Management of these cases includes elimination or remediation of environmental sources of lead, nutritional education and intervention, behavioral and developmental interventions, early education programs, and medical management.[4,15,16,17]

Nutritional Intervention: Children with elevated blood lead at or above 5 µg/dL are often at risk for poor nutrition related to their socio-economic status. Nutritional education and support is critical to make sure that at-risk children receive a well-balanced and age-appropriate diet high in calcium, iron and vitamin C, nutrients that may help keep lead from being absorbed. A variety of programs offering nutritional intervention are available, as exemplified by the Women, Infant, and Children (WIC) program.[18,19] Numerous opportunities exist to increase synergism between lead poisoning prevention and WIC programs, including increases in cross-program education and outreach, and co-location of WIC and blood lead testing sites.

Developmental Interventions that can be considered are:

- Provide regular developmental and behavioral screening for all children with valid and reliable screening tools for early identification of risks and needs.
- Long-term developmental surveillance to screen for lead's adverse effects on cognition, school performance and behavior (e.g., hyperactivity, ADHD). This surveillance should continue beyond age 6 years for the normalization of blood lead.
- Include a history of a child's blood lead results in the child's medical record.
- Quickly identify emerging difficulties at critical educational transition points in childhood, and watch for behaviors that interfere with learning, such as inattention and distractibility.
- Consider a referral of children experiencing neurodevelopmental problems for a thorough diagnostic evaluation and be advocates for the child to receive assistance.

Medical Intervention: Chelation therapy is a medical procedure that involves the administration of chemical chelating agents to remove heavy metals (lead and others) from the body. Guidance regarding the consideration of chelation therapy is linked to a child's having a blood lead test result greater than, or equal to, 45 µg/dL. Chelation therapy is not recommended for lower blood lead levels as it has not proven to be effective with blood lead levels between 20 and 44 µg/dL.

SECTION 4:
U.S. Federal Regulations and Guidance

The United States has many regulations to address lead exposures in children. Table 2 lists the lead regulations of five federal agencies. The regulations are published in the Code of Federal Regulations (CFR), which is divided into titles (e.g., title 16, Commercial Practices), parts (e.g., part 1500, Hazardous Substances and Articles; Administration and Enforcement Regulations), and sections (e.g., 1500.17, Banned Hazardous Substances); see the table's listing of 16 CFR § 1500.17 as an example.

Table 2. U.S. federal regulations and guidance to address lead exposures for children

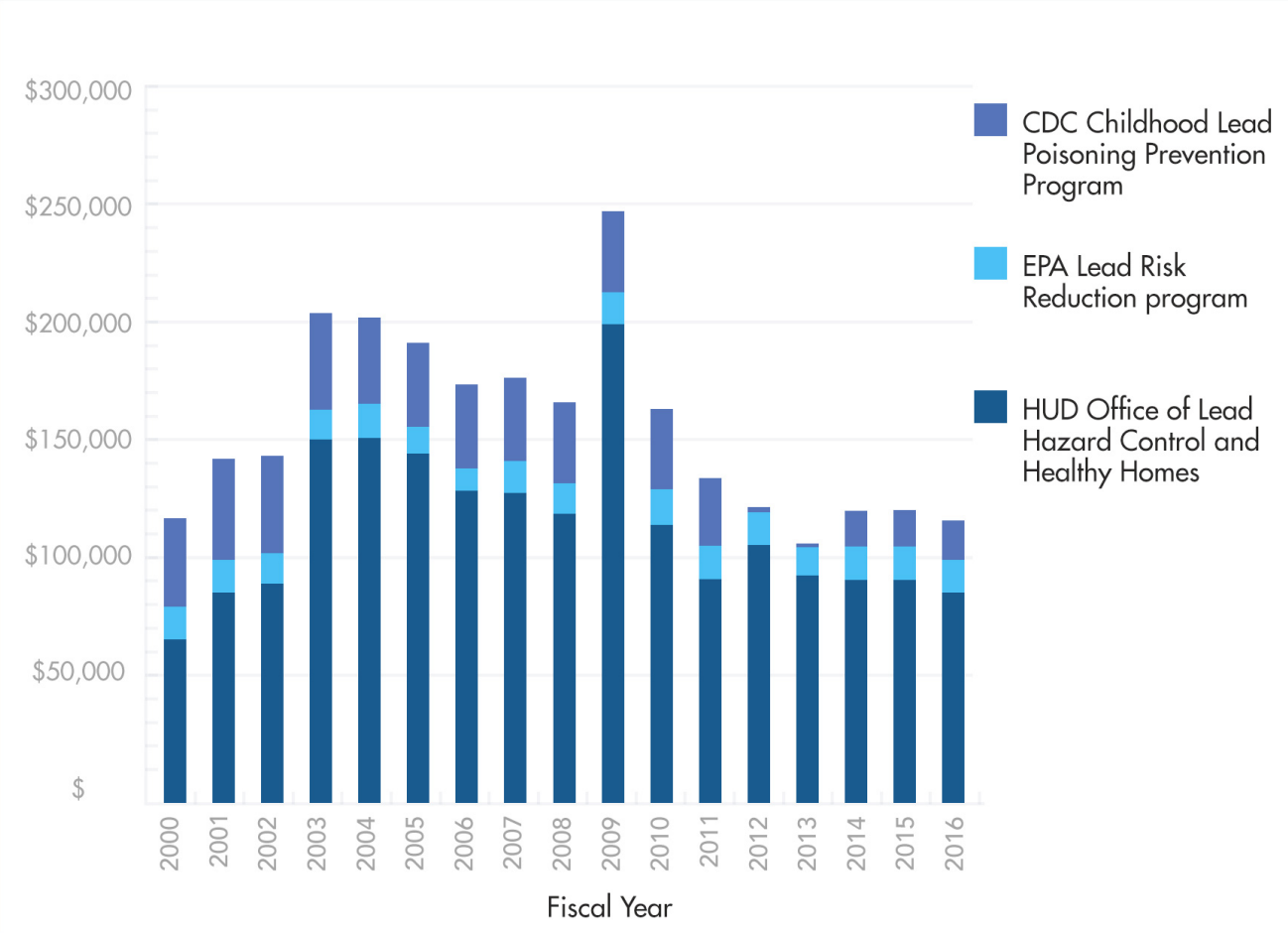
Agency	Lead source	Section title	Code of Federal Regulation references
Consumer Product Safety Commission	Candle wicks	Banned Hazardous Substances	16 CFR § 1500.17
-	Children's products containing lead	Children's Products Containing Lead: Consumer Product Safety Improvement Act of 2008	16 CFR §§ 1500.87–1500.88 1500.90–1500.91
-	Paint/coatings	Ban of Lead-Containing Paint and Certain Consumer Products Bearing Lead-Containing Paint	16 CFR §§ 1303.1 - 1303.5
U.S. Environmental Protection Agency	Ambient (outdoor) Air - Monitoring	Ambient Air Monitoring Reference and Equivalent Methods, Test Procedure for Methods for Lead	40 CFR § 53.33
-	Ambient (outdoor) Air - Monitoring	Ambient Air Quality Surveillance - Subpart B Monitoring Network, Quality Assurance Requirements, Network Design Criteria, Monitor Path Siting Criteria	40 CFR §§ 58.10 – 58.16 and part 58 appendices A, D and E
-	Ambient (outdoor) Air - Standards	National Primary and Secondary Ambient Air Quality Standards for Lead	40 CFR § 50.12 and part 50, appendices G, Q and R
-	Ambient (outdoor) Air - Standards Implementation	Air Programs - Requirements for Preparation, Adoption, and Submittal of Implementation Plans - Procedural Requirements and Control Strategy	40 CFR §§ 51.100 -51.116, 40 CFR § 51.117
-	Ambient (outdoor) Air - Standards Implementation	Air Programs - Requirements for Preparation, Adoption, and Submittal of Implementation Plans - Review of New Sources and Modifications and General Conformity	40 CFR §§ 51.160-166
-	Ambient (outdoor) Air - Standards Implementation	Air Programs - Determining Conformity of General Federal Actions to State or Federal Implementation Plans	40 CFR §§ 93.150-165
-	Disclosure of Known Lead Paint and/ or Lead-Based Paint Hazards Upon Sale or Lease of Residential Property	Lead-Based Paint Poisoning Prevention in Certain Residential Structures	40 CFR § 745.100-119
-	Drinking water	Control of Lead and Copper Including Monitoring Requirements for Lead and Copper in Tap Water Control of Lead	40 CFR §§ 141.80 - 141.91
-	Lead-Based Paint Activities	Lead-Based Paint Poisoning Prevention in Certain Residential Structures	40 CFR § 745.220-239
-	Lead-Based Paint Hazards	Lead-Based Paint Poisoning Prevention in Certain Residential Structures	40 CFR § 745.61-65
-	National Emissions Standards for Hazardous Air Pollutants	National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting, and National Emissions Standards for Hazardous Air Pollutants for Primary Lead Processing, National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources, National Emission Standards for Hazardous Air Pollutants for Primary Copper Smelting, National Emission Standards for Hazardous Air Pollutants for Primary Copper Smelting Area Sources and other National Emission Standards for Hazardous Air Pollutants that may result in reduced lead emissions	40 CFR part 63, including subparts X, PPPPPP, QQQ, EEEEEE and TTT
-	Plumbing components	Prohibition on Use or Introduction into Commerce of Lead Pipes, Solder, and Flux	42 U.S.C.300g-6
-	Residential Property Renovation	Lead-Based Paint Poisoning Prevention in Certain Residential Structures	40 CFR § 745.80-92
-	State and Indian Tribal Programs Activities	Lead-Based Paint Poisoning Prevention in Certain Residential Structures	40 CFR § 745.320-339
-	Hazardous waste, cleanups Waste management, disposal	Comprehensive Environmental Response, Compensation, and Liability Act Resource Conservation and Recovery Act	40 CFR part 300, 40 CFR §§ 260-273
U.S. Food and Drug Administration	Dietary supplements	Current Good Manufacturing Practice in Manufacturing, Packaging, Labeling or Holding Operations for Dietary Substances	21 CFR §§ 111.1 - 111.610
-	Food	Food Standards: General	21 CFR §§ 130.3 - 130.20
-	Food	FDA regulations and guidance for bottled water, candy, juice, etc.	21 CFR § 165.110, 21 CFR Part 120, 21 CFR Part 120 Compliance Policy Guides
-	Materials that contact food (domestic)	Indirect Food Additives: General Guidance	21 CFR §§ 174.5 - 174.6, FDA Compliance Policy Guides
-	Prescription and over-the-counter drugs	Labeling	21 CFR §§ 201.1 - 201.327
U.S. Department of Housing and Urban Development	Disclosure of lead paint at property transfer	Disclosure Requirements for Sellers and Lessors	24 CFR § 35.80 - 35.98
-	Residential lead paint hazards in federally subsidized properties	Lead-Based Paint Poisoning Prevention in Certain Residential Structures	24 CFR §§ 35.100 - 35.1355
Occupational Safety and Health Administration	Worker protection for general industry	Lead	29 CFR § 1910.1025
-	Worker protection for the construction industry	Lead	29 CFR § 1926.62
	Worker protection for shipyard employment	Lead	29 CFR 1915.1025

SECTION 5:
Next Steps

This report captures current and planned federal government activities addressing lead exposures. However, these activities have changed over time as the recognition of the issues surrounding lead exposures and agency initiatives have evolved. For lead, like most programs, the level of effort that federal departments and agencies are able to undertake is dependent on congressional appropriations. The budgets for lead efforts have varied over time, as exemplified by the following budget summaries from 2000 to the present (Figure 4). In addition to the information in the figure, budget data from the National Institutes of Health (NIH) were available only from 2012 to the present; these show funding for lead to be consistent at $7–8 million annually. The ability to meet the evolving needs of communities around lead exposure prevention will continue to be dependent on federal funding.

FIGURE 4

Funding for key federal lead programs (dollars in thousands)



Additional federal efforts and coordination of approaches are needed because the harmful effects of childhood lead exposures persist. For this reason, discussing federal efforts that address multiple sources of lead exposure in children is an ongoing priority for the Task Force, especially given recent lead exposure events of national significance (e.g., drinking water contamination in Flint, Michigan). This report presents the breadth of federal efforts addressing lead exposures to foster new or to expand existing collaborations among federal departments and agencies.

This report is also a step toward the development of a new strategy to reduce lead exposures among children in the United States. Initial steps in pursuing a new strategy include identifying needs and gaps within the current approaches described in this report, as well as developing an understanding of how the CDC reference value (different from the previous CDC "level of concern") can best be used by lead programs across the federal government. The Task Force will work to complete this goal in coordination with the development of Healthy People 2030 and is dedicated to taking the initial steps described here within a year of publishing this report. The Task Force departments and agencies continue to work together to make adverse health impacts due to childhood lead exposure a thing of the past.

SECTION 6:
Cross-Referencing Federal Activities by Theme

Table 3 lists the major activities of federal agencies to address lead exposures as inventoried in this document. The rows indicate the department/agency activity, and the columns describe thematic areas that each activity may address. Check marks indicate an agency contribution to a thematic area, while boxes left blank indicate that the activity is generally not applicable to a thematic area. A description of each activity is found in Section 7, following the table.

TABLE 3. Major federal activities that address lead exposure by theme

Activity or Program	Activity or Program Number	Primary Prevention	Secondary Prevention	Research	Biomonitoring / Surveillance / Reference Value	Housing / Building Related (paint, dust, soil, drinking water)	Environment (air, soil, etc.)	Consumer Products & Food	Public Outreach	Technical Assistance
CPSC: Lead Content Limits for Children's Products and Paint	7.1	✓	-	-	-	-	-	✓	-	-
ED: Education Facilities Clearinghouse Technical Assistance, Training and Online Resources	7.2	✓	-	-	-	✓	✓	-	✓	✓
DOJ: Environment and Natural Resources Division	7.3	✓	✓	-	-	✓	✓	-	-	-
DOL: Occupational Safety and Health Administration	7.4	✓	-	-	-	✓	-	-	-	-
DOT/FAA: Piston Aviation Fuel Initiative	7.5	-	-	-	-	-	✓	-	-	-
EPA and HHS/ATSDR: Pediatric Environmental Health Specialty Units	7.6	✓	✓	✓	✓	✓	✓	✓	✓	✓
EPA: Addressing Lead at Corrective Action Sites	7.7	✓	-	-	-	-	✓	-	-	-
EPA: Lead-Based Paint Program	7.8	✓	✓	-	-	✓	-	-	✓	✓
EPA: Deterrent Enforcement to Lead Exposure	7.9	✓	-	-	-	✓	-	-	-	-
EPA: Evaluation of air pollution associated with lead emitted from piston-engine aircraft	7.10	✓	-	-	-	-	✓	-	-	-
EPA/Office of International and Tribal Affairs and Office of Chemical Safety and Pollution Prevention: Global Elimination of Childhood Lead Poisoning from Lead in Paint	7.11	✓	-	-	-	✓	-	✓	✓	✓
EPA: Improving Assessment of the Benefits of Lead Exposure Reductions	7.12	-	-	✓	-	-	-	-	-	-
EPA: Lead Research	7.13	-	-	✓	-	-	✓	-	-	-
EPA/Office of Water and Office of Enforcement and Compliance Assurance: Reducing Lead in Drinking Water through Regulations, Enhanced Implementation and Enforcement	7.14	✓	-	-	-	✓	-	-	-	-
EPA: Providing Outreach, Improving National Consistency in the Lead-Based Paint Inspection Program and Identifying Priority Areas for Inspections	7.15	✓	-	-	-	✓	-	-	-	-
EPA: Review and Implementation of the National Ambient Air Quality Standards for Lead	7.16	✓	-	-	-	-	✓	-	-	-
HHS/ACF: Child Care and Development Fund	7.17	✓	-	-	-	✓	-	-	✓	✓

TABLE 3. Major federal activities that address lead exposure by theme

Activity or Program	Activity or Program Number	Primary Prevention	Secondary Prevention	Research	Biomonitoring / Surveillance / Reference Value	Housing / Building Related (paint, dust, soil, drinking water)	Environment (air, soil, etc.)	Consumer Products & Food	Public Outreach	Technical Assistance
HHS/ACF: Early Head Start (EHS) Child Care Partnerships Funding Opportunities	7.18	-	✓	-	✓	-	-	-	✓	✓
HHS/ACF: EHS and Head Start Services	7.19	-	✓	-	✓	-	-	-	✓	✓
HHS/ACF: Guidance on Basic Health and Safety Standards for Early Care and Education for State Child Care Licensing and Quality Rating Improvement Systems (QRIS)	7.20	✓	-	-	-	✓	-	-	-	✓
HHS/ACF: Memorandum of Understanding (MOU) between EPA, Region 2 and HHS/ACF, Region 2	7.21	✓	✓	-	-	✓	✓	-	✓	-
HHS/ACF: Outreach to Head Start and Child Care and Development Fund Grantees on Lead Exposure in Children	7.22	-	✓	-	-	-	-	-	-	✓
HHS/CDC/ATSDR: Conducting public health assessments on lead exposure	7.23	-	✓	✓	-	-	✓	-	✓	✓
HHS/CDC/ATSDR: Guidance on Choosing Safe Places for Child Care	7.24	✓	-	-	-	-	✓	-	✓	✓
HHS/CDC/ATSDR: Geospatial Research, Analysis and Services Program (GRASP) Support for Site-Specific Lead Investigations and Response	7.25	-	-	✓	✓	-	-	-	✓	-
HHS/CDC/ASTDR: Toxicological Profile for Lead	7.26	-	-	✓	-	-	-	-	-	-
HHS/CDC: Lead Poisoning Prevention Program	7.27	✓	✓	-	✓	✓	-	-	-	-
HHS/CDC/ATSDR: Lead Poisoning Prevention Subcommittee of the NCEH/ATSDR Board of Scientific Counselors	7.28	-	✓	-	✓	-	-	-	-	✓
HHS/CDC: National Biomonitoring Program	7.29	-	✓	-	✓	-	-	-	-	✓
HHS/CMS: Blood Lead Screening for Children Enrolled in Medicaid	7.30	-	✓	-	✓	-	-	-	-	-
HHS/FDA: Monitoring domestic and imported foods for unsafe levels of lead and developing regulations or guidance to establish appropriate maximum lead levels in foods	7.31	✓	-	-	-	-	-	✓	✓	✓
HHS/FDA: Decrease the Codex maximum levels for lead in various foods through the Codex Committee on Contaminants in Food	7.32	✓	-	-	-	-	-	✓	-	-
HHS/HRSA/BPHC: Provides funds to National Training and Technical Assistance Cooperative Agreement	7.33	✓	-	-	-	-	-	-	✓	✓
HHS/HRSA: Reproductive and Environmental Health Network (REHN) program at the Organization of Teratology Information Specialists	7.34	✓	-	-	-	-	-	-	✓	-
HHS/IHS: Provision of comprehensive public health services to tribes to ensure safe drinking water, healthy homes and children's environments	7.35	✓	✓	-	-	✓	✓	-	✓	-
HHS/NIH: NICHD Research on the Effects of Lead Across the Lifespan	7.36	-	-	✓	-	-	-	-	-	-
HHS/NIH: Data review and monograph development on lead	7.37	-	-	✓	-	✓	-	-	-	-

TABLE 3. Major federal activities that address lead exposure by theme

Activity or Program	Activity or Program Number	Primary Prevention	Secondary Prevention	Research	Biomonitoring / Surveil-lance / Reference Value	Housing / Building Related (paint, dust, soil, drinking water)	Environment (air, soil, etc.)	Consumer Products & Food	Public Outreach	Technical Assistance
HHS/NIH: Disaster Research Response Program	7.38	-	✓	✓	-	✓	-	-	-	-
HHS/NIH: Environmental Influences on Child Health Outcomes (ECHO) including the Children's Health Exposure Analysis Resource (CHEAR)	7.39	-	-	✓	-	✓	✓	✓	-	-
HHS/NIH: NIEHS extramural research portfolio on health impacts of exposure to lead	7.40	-	-	✓	-	-	-	-	-	-
HHS/NIH: Lead exposure and health outreach and communications	7.41	✓	-	-	-	✓	✓	✓	✓	-
HHS/NIH: National Toxicology Program Monograph on Health Effects of Low-Level Lead	7.42	-	-	✓	-	-	-	-	✓	-
HHS/NIH: National Institute of Environmental Health Sciences (NIEHS) Worker Training Program (WTP)	7.43	✓	-	-	-	-	-	✓	-	✓
HHS/NIH: Enviro-Health Links – Lead and Human Health	7.44	✓	-	-	-	-	-	✓	-	✓
HHS/NIH: Hazardous Substances Data Bank Lead Overview and Chemical Records	7.45	-	-	✓	-	-	-	-	-	-
HHS/NIH: Outreach to students, teachers, and consumers	7.46	-	-	✓	-	-	-	-	-	-
HHS/NIH: Online Databases in Toxicology and Environmental Health and Medicine	7.47	✓	-	-	-	✓	✓	✓	✓	-
HHS/OASH: Lead-based Paint Pilot Program in Memphis, Tennessee	7.48	✓	-	-	-	✓	-	-	✓	✓
HHS/ODPHP: Healthy People 2020	7.49	✓	-	-	-	-	-	-	✓	-
HHS/OGA: Role of the health sector in the sound management of chemicals	7.50	✓	-	-	-	-	-	-	-	-
HHS/SAMHSA: Addressing Behavioral Health Impacts of Adverse Environmental Exposures	7.51	-	✓	-	-	-	-	-	✓	-
HUD: Enforcement of the Lead Disclosure Rule and the Lead-Safe Housing Rule, plus providing technical support	7.52	✓	-	-	-	✓	-	-	✓	-
HUD: Lead-Based Paint Hazard Control (LHC) and Reduction Demonstration (LHRD) Grant Program	7.53	✓	✓	-	✓	✓	-	-	-	-
HUD: Lead-Safe Homes, Lead-Free Kids Toolkit	7.54	✓	✓	✓	✓	✓	-	-	✓	✓
HUD: Support for Research to Improve Methods to Identify and Control Residential Lead-Based Paint Hazards and Track Lead Hazards in U.S. Housing	7.55	✓	✓	✓	-	✓	-	-	-	-
USDA/NIFA: Michigan State University Extension	7.56	-	✓	-	-	✓	-	-	✓	-
HUD & USDA: Healthy Homes Initiative	7.57	✓	-	✓	-	✓	-	-	✓	✓
USDA/Food and Nutrition Service: Using Nutrition as a Tool to Reduce Lead Absorption	7.58	✓	✓	-	-	-	✓	✓	-	-

SECTION 7:
Current and Planned Federal Programs & Activities

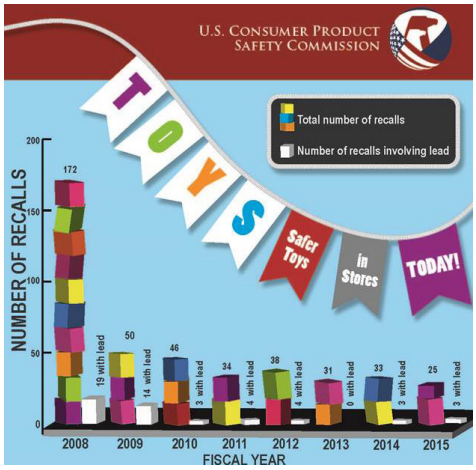
Below are descriptions of current and planned federal activities to reduce childhood lead exposure and eliminate associated adverse health outcomes. This section is presented by organization; please refer to the cross-reference table in the previous section to view efforts by theme.

7.1 Consumer Product Safety Commission: Lead Content Limits for Children's Products and Paint

The Consumer Product Safety Commission (CPSC) helps prevent the exposure of children to lead by establishing and enforcing lead-content limits for children's products and by conducting testing and surveillance of products to monitor compliance with the limits.

Section 101 of the Consumer Product Safety Improvement Act of 2008 (CPSIA) established lead-content limits for component parts of children's products and directed the CPSC to revise the lead-in-paint regulations in 16 CFR part 1303 that apply to paint and similar surface coatings intended for consumer use, including certain furniture as well as toys and other articles for use by children. CPSIA requires that children's products be tested by a CPSC-accepted third-party laboratory for demonstration of compliance. Based on such testing, federal law requires the manufacturer or importer to certify the children's product as compliant with the applicable consumer product safety requirements. The CPSC also has authority to require warning labels, and to regulate or ban hazardous substances, including lead, in specific products under certain circumstances. For example, the CPSC used this authority to restrict the use of lead in candle wicks.

Lead limits for component parts of children's products and for paints and similar surface coatings prevent harmful lead exposures from these consumer products. Requirements for third-party testing and certification by manufacturers and importers help reduce the number of non-complying products entering the market. Ongoing CPSC surveillance, sampling and testing, in conjunction with federal and state agencies responsible for monitoring products in commerce, reinforce the requirements and remove non-compliant products from the market. CPSC recall data show a dramatic reduction in recalls for non-complying toys, including for lead content, since implementation of the CPSIA in 2008. This demonstrates the impact of the law's requirements and CPSC enforcement efforts.



Websites for more information:
https://www.cpsc.gov/en/Regulations-Laws--Standards/Statutes/
https://www.cpsc.gov/en/Regulations-Laws--Standards/Statutes/The-Consumer-Product-Safety-Improvement-Act/
https://www.cpsc.gov/lead

7.2 Department of Education – Education Facilities Clearinghouse: Technical Assistance, Training and Online Resources

The Education Facilities Clearinghouse (EFC) helps decrease lead hazards at schools by offering free, onsite technical assistance as well as web-based resources that focus on managing exposure to lead in schools and retrofitting facilities to address lead concerns. The technical assistance, training and availability of online resources offer guidance for facility leaders to address lead-related issues in school buildings.

The EFC is a program of the George Washington University and is funded by the Department of Education. It is a popular source of research and information pertaining to lead issues at school facilities. Schools that encounter issues with lead exposure to school personnel and students can receive technical assistance and onsite trainings that are offered on a case-by-case basis and address the particular needs of a facility. The EFC collects and disseminates open-source materials on the topic of lead in schools. The website houses and categorizes documents that address a range of lead issues (e.g. lead and water pipes). The EFC's social media platforms (i.e., Twitter, Facebook and LinkedIn) share current news and videos about the effects of lead in educational facilities and ways to address these concerns. The EFC regularly promotes webinars from the EPA, the CDC and other organizations that address topics related to facilities and occupant health.

The programs and operations of the EFC are ongoing, and the expansion of the EFC online library is a continual process.

Website for more information:
http://www.efc.gwu.edu

7.3 Department of Justice – Environment and Natural Resources Division

As one of the Department of Justice's (DOJ's) six litigating divisions, the Environment and Natural Resources Division (ENRD) brings cases against those who violate the nation's civil and criminal pollution-control laws, defends environmental challenges to government programs and represents the United States in matters concerning the stewardship of the nation's natural resources and public lands. The DOJ acquires real property for the federal government by eminent domain, brings and defends cases under wildlife-protection laws and litigates cases concerning Indian rights and claims. The DOJ's efforts are generally driven by requests from agencies such as the EPA, HHS, HUD and the Department of the Interior, and by practices set by those agencies.

The DOJ complements agency programs to ensure healthier and safer homes for children by enforcing laws, such as the Residential Lead Paint Hazard Reduction Act. This statute's lead disclosure requirements protect the public, and children in particular, from unnecessary health risks. Past settlements have resulted in the abatement of lead-paint hazards and secured civil penalties and child health improvement projects.

The DOJ has brought cases against landlords for obstructing justice and submitting false lead-paint disclosure forms required under that statute. For instance, in 2008, in *United States v. VIP Properties, LLC*, the defendant managed 10 residential properties in Minnesota containing approximately 292 units that were constructed before 1978 and allegedly failed to inform its residents of the presence and hazards of lead-based paint. Sixty-nine of the properties housed children under the age of 6 years. As part of the settlement, VIP Properties agreed to perform hazard abatements in the properties, perform a $50,000 child health improvement project by replacing windows in 35 low-income properties and pay a civil penalty of $7,500.

Similarly, in *United States v. Hardesty*, the defendant, who managed properties in Rockford, Illinois, allegedly failed to inform tenants that their homes may contain potentially dangerous levels of lead. Local officials identified lead-based paint and lead-based paint hazards in the units and at least seven children with elevated blood lead levels in the subject properties. The United States filed a complaint against the defendant pursuant to the Residential Lead Paint Hazard Reduction Act. As part of the settlement, the defendant agreed to replace windows and clean up lead-based paint hazards in 50 rental properties. In addition to the $308,000 worth of lead abatement work, Hardesty agreed to pay $5,000 in penalties. Going forward, Hardesty ensured that he will provide information about lead-based paint to tenants before they are obligated to sign any lease.

The DOJ has also actively enforced the Lead Renovation, Repair, and Painting Rule (RRP Rule), which implements the federal Toxic Substances Control Act (TSCA). The RRP Rule is intended to ensure that owners and occupants of housing built before 1978, as well as any child-occupied facilities, receive information on lead-based paint hazards before renovations begin, and that individuals performing such renovations are properly trained and certified by the EPA and follow specific work practices to reduce the potential for lead-based paint exposure. Home improvement companies that contract with renovators to perform renovation work must ensure that those contractors comply with all of the requirements of the RRP Rule. The EPA enforces the RRP and other lead rules to protect children and others who are vulnerable to exposure to lead dust that can cause lead poisoning. For example, the government settled a case in 2014 alleging that Lowe's Home Centers – one of the nation's largest home-improvement retailers – failed to provide documentation showing that its contractors had been certified by the EPA, had been properly trained, had used lead-safe work practices or had correctly used EPA-approved lead test kits at renovation sites. The EPA's investigation found that Lowe's contractors had failed to ensure that work areas had been properly contained and cleaned during renovations at three homes. The EPA's investigation was prompted by tips and complaints submitted by the public. In settling the case, Lowe's agreed to implement a comprehensive, corporate-wide compliance program at its more than 1,700 stores nationwide to ensure its contractors minimize lead dust from home-renovation activities, as required by the RRP Rule. The company also paid a $500,000 civil penalty, which was, at the time of the settlement, the largest ever for violations of the RRP Rule. The settlement stems from violations, discovered by EPA inspectors, of the RRP Rule's recordkeeping and work practice standards at private homes that had been renovated by Lowe's contractors.

7.4 Department of Labor – Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) helps prevent workplace exposures to lead by promulgating and enforcing standards for lead exposure in general industry (29 CFR 1910.1025), construction (29 CFR 1926.62), and shipyard employment (29 CFR 1915.1025). The OSHA-permissible exposure limit (PEL) for lead is 50 $\mu g/m^3$ averaged over an eight-hour period. OSHA requirements include respiratory protection, protective work clothing and equipment, housekeeping, hygiene facilities and practices, medical surveillance, blood lead testing, medical removal protection, employee information and training and recordkeeping.

OSHA's lead standards help reduce fetal and infant exposure to lead by limiting exposure among adult workers and by reducing the amount of lead that may transfer from the blood of an exposed worker to a developing fetus during pregnancy or to breast milk during lactation. OSHA's lead standards that pertain to hygiene facilities and practices reduce the potential for transfer of lead from the workplace into workers' homes.

OSHA's current lead standards were established before the recent emergence of new information on adverse health effects from low-level lead exposure. They allow for the return of an employee from medical removal to their former job when the employee's blood lead level is below 40 µg/dL. In response to medical findings that lower blood lead levels can result in adverse health effects including hypertension, cognitive dysfunction, effects on renal function and adverse female reproductive outcomes, OSHA is exploring regulatory options to lower blood lead levels in affected workers. An Advanced Notice of Proposed Rulemaking will seek input from the public to help OSHA identify 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.

Websites for more information:
https://www.osha.gov/SLTC/lead/
https://www.osha.gov/Publications/OSHA3680.pdf

7.5 Department of Transportation – Federal Aviation Administration: Piston Aviation Fuel Initiative

The Federal Aviation Administration (FAA) is conducting a research and development program to identify unleaded aviation fuels that can replace the leaded fuels currently used in piston-powered aircraft. Approximately 167,000 piston-powered general aviation aircraft in the United States rely on 100 low-lead aviation gasoline (avgas) for safe operation. Avgas is the only remaining transportation fuel in the United States that contains lead and is needed to supply the very-high-octane levels needed for high-performance aircraft. Most commercial airplanes do not use leaded gas. Identifying unleaded alternative fuels for this fleet of aircraft requires certifying engines and aircraft to operate on these fuels. Success in this area would reduce lead emissions to the air by more than 400 tons annually.

The FAA's goal is to identify a replacement fuel(s) for leaded aviation gasoline that is usable by most general aviation aircraft by 2018. The FAA's research and development program team is currently evaluating unleaded fuels at its William J. Hughes Technical Center and will issue reports with the approved candidate fuels once their evaluation is complete. These reports will allow the fuel producers to obtain an ASTM production specification and provide data for the FAA to authorize existing engines/aircraft to operate on these fuels.

The EPA's section on leaded aviation fuel details the EPA's ongoing evaluation, under section 231 of the Clean Air Act (see 7.10). This evaluation will determine whether lead emissions from the use of leaded aviation gasoline cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. If the EPA were to make a positive endangerment finding, the agency would be required under the Clean Air Act to propose and establish emissions standards concerning lead emissions from the relevant aircraft engines. The FAA would then be required to adopt regulations to ensure compliance with such engine emissions standards.

Website for more information:
https://www.faa.gov/about/initiatives/avgas

7.6 Environmental Protection Agency and Agency for Toxic Substances and Disease Registry: Pediatric Environmental Health Specialty Units

The EPA and ATSDR created and fund the Pediatric Environmental Health Specialty Units (PEHSUs). PEHSUs help prevent lead's adverse health effects by providing expert consultation, advice and prevention messages on lead exposure in children. The PEHSUs are a network of pediatricians and healthcare providers that provide assistance on all children's environmental health issues, with lead being the number one substance of concern for children throughout the network. PEHSU data show that the most frequently reported exposures are in children under 2 years of age, with the exposure site most often in homes.

The PEHSUs work with healthcare professionals, parents, schools, community groups and others to provide information on protecting children from environmental hazards. They also work with federal, state and local agencies to provide community education and outreach, the training of health professionals and consultation and referral.

Website for more information:
www.pehsu.net

7.7 Environmental Protection Agency – Office of Land and Emergency Management: Addressing Lead at Superfund and Corrective Action Sites (Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act Sites)

The EPA's Office of Land and Emergency Management (OLEM) helps prevent childhood lead exposure by assessing and managing sites that have been contaminated by lead, with actions focused on preventing exposure and cleaning up lead contamination. OLEM endeavors to enhance its approaches and understanding of the health risks from lead contamination at contaminated sites. The manner in which these activities are conducted, and coordinated, with other agencies is described below.

OLEM and its 10 regional offices perform a range of activities at contaminated sites, which can include site investigation to determine the extent of contamination, assessment of risks using site-specific information, and, when appropriate, develop and implement a plan to reduce and prevent exposures. This often requires the removal and/or capping of contaminated soils. Since children can be exposed to lead from multiple sources, such as lead in paint, food, drinking water and soil, a vital component of OLEM's comprehensive approach for addressing lead contaminated sites is coordination with federal, state, and local partners to address multimedia sources of lead exposures (e.g., HUD, Agency for Toxic Substances and Disease Registry (ATSDR)).

OLEM is currently reviewing its policies and practices for addressing lead contamination. In the near-term, OLEM is reviewing its policy for determining if areas with lead contamination and the associated exposures represent an unacceptable health risk. Other aspects of the work will likely require several years to complete, but are expected to result in important benefits by enhancing understanding of lead exposure and increasing the accuracy of the models used to conduct risk evaluations. These efforts will include the exploration of lead exposure models for contaminated sites that will improve predictions of risk to both children and adults, and thus advance policies and practices for public health protection.

Website for more information:
https://www.epa.gov/superfund/lead-superfund-sites

7.8 Environmental Protection Agency – Office of Chemical Safety and Pollution Prevention: Lead-based Paint Program and EJ2020 Action Plan

EPA's Lead-based Paint Program addresses primarily residential sources of lead exposure by providing tools to identify where dangerous conditions exist, address those conditions and/or exposure pathways and prevent new hazards from being carelessly created. The program consists of four sub-programs: the Lead-Based Paint Activities Program, the Disclosure Program, the Renovation, Repair and Painting Program and the Public Education and Outreach Program. The implementation and coordination of these programs are described below. In addition, the program has developed standards identifying hazardous conditions of lead in paint and hazardous levels of lead in residential dust and soil. Those standards are currently under review and may be adjusted in the future.

The **LEAD-BASED PAINT ACTIVITIES PROGRAM** focuses on inspection, risk assessment and abatement of lead-paint hazards by establishing standards for these activities that are safe, reliable and effective and by establishing training and certification programs for these lead professionals and their firms. The program provides the regulatory infrastructure to ensure a supply of qualified professionals trained and certified to implement those standards. Thirty-nine states, four tribes and the District of Columbia are authorized to implement lead-based paint programs in their jurisdictions. In the 11 states where the EPA implements the abatement program, there are approximately 40 accredited training providers for lead-based paint activities and more than 2,000 certified abatement firms.

The **RENOVATION, REPAIR AND PAINTING PROGRAM (RRP)** reduces the creation of new lead hazards in homes and child-occupied facilities built before 1978 by establishing training and certification programs for renovators, including those involved in renovation, repair, painting, and similar work, and firms who may disturb lead paint in the course of their work. This entails preventing lead-dust hazards by adhering to lead safe work practices and specialized cleaning practices. Fourteen states and one tribe are authorized to implement the RRP program in their jurisdictions. Through the RRP program, the EPA has accredited more than 400 training providers and more than 90,000 certified renovation firms as capable of providing lead-safe renovation, repair and painting services; a nationwide list of these resources is available on the EPA's website. The program is currently analyzing whether renovations of public and commercial buildings present a hazard, and if so, will consider similar approaches. OCSPP also provides funds to EPA regions as well as states, tribes and territories to develop and implement programs under the Lead-based Paint Activities Program and RRP program. In addition, OCSPP provides guidance to the EPA regions to promote national consistency.

The **DISCLOSURE PROGRAM** establishes the legal requirements for disclosure of lead-based paint and lead-based paint hazards in home sales and rentals and educates the public on the risks of lead-based paint and how best to manage those risks. The program has increased awareness of residential lead-based paint and lead-based paint hazards by establishing disclosure requirements that ensure that individuals are informed of the lead-based paint hazards when buying or renting housing units. The disclosure rule applies to the sale or lease of units built before 1978, requiring that a pamphlet as well as site-specific information on the presence of lead in the unit and its potential hazards be provided to buyers or renters.

The **PUBLIC EDUCATION AND OUTREACH PROGRAM** educates parents, homeowners and the medical community on the risks of lead-based paint and how to reduce the risks. The program manages a website for the public as well as the National Lead Information Center, which provides regulated contractors and consumers with information on lead poisoning prevention and lead-safe abatement and renovation practices. The outreach program coordinates with HUD and the CDC to develop print, web and social media materials to recognize National Lead Poisoning Prevention Week. The program spreads lead awareness through partnerships with organizations, such as contractor locator firms and historically black colleges and universities. A special pilot project is planned to involve a three-step process involving outreach, reduced cost training and follow-up enforcement to increase awareness and compliance with the RRP rule in four select cities. In collaboration with the United Nations Environment Program and the World Health Organization, the EPA is also leading the effort to spread lead awareness on a global scale through the International Lead Poisoning Prevention Week of Action.

The **EJ2020 ACTION AGENDA** is EPA's strategic plan for actions to be taken through 2020 to reduce environmental and health disparities for minority, low-income and tribal populations in the nation's most overburdened communities. In the EJ2020 plan, EPA has identified disparities in childhood blood lead levels as a nationally significant environmental challenge. To address this challenge, EPA is committed actions aimed at eliminating disparities in childhood blood lead levels. These actions include: (1) convening partners to identify geographic areas with the greatest lead exposures, (2) working with those partners to reduce sources of lead contamination in the communities identified, and (3) taking national regulatory action to reduce lead in drinking water.

Website for more information:
https://www.epa.gov/lead

7.9 Environmental Protection Agency – Office of Enforcement and Compliance Assurance: Deterrent Enforcement to Lead Exposure

The EPA's Office of Enforcement and Compliance Assurance (OECA) helps decrease childhood lead exposure by taking enforcement actions against violators of lead-based paint rules administered under the EPA's Toxic Substances Control Act (TSCA) Lead-based Paint Program. A main purpose of the TSCA Lead-based Paint Program is to protect children from the hazards of lead-based paint by ensuring that contractors and other regulated entities comply with lead-based paint rules. Enforcement actions bring violators into compliance, deter future noncompliance and protect the public from lead exposure. OECA activities with regional partners can be national in scope as exemplified by the joint effort with the EPA's National Program Chemicals Division to conduct a pilot outreach and education initiative in six select cities, involving enforcement as needed.

OECA also provides funds to EPA regions and states, tribes and territories to conduct inspections and enforcement actions. OECA offers education to regulated entities regarding compliance with the lead-based paint rules. If necessary, the EPA may pursue enforcement actions to bring violators into compliance.

The impact is that the entity subject to enforcement returns to compliance is expected to and perform future activities in a lead safe manner. This also has the impact of increased awareness among the regulated community. Awareness is also promoted via press releases and other mechanisms used to highlight agency actions. EPA believes long-term and national-level impacts are enhanced from high-visibility cases, and the collective body of actions taken across the country that have a deterrent effect on the regulated community. This is enhanced by OECA's outreach and educational initiatives in concert with regional and program offices.

Websites for more information:
https://www.epa.gov/lead
https://www.epa.gov/sites/production/files/2015-04/documents/fy1617oecanpmguidance.pdf

https://www.epa.gov/newsreleases/epa-settlements-help-protect-public-against-health-hazards-lead-exposure
https://www.epa.gov/compliance/toxic-substances-control-act-tsca-compliance-monitoring
https://www.epa.gov/enforcement/waste-chemical-and-cleanup-enforcement#chemical

7.10 Environmental Protection Agency – Office of Air and Radiation: Evaluation of Air Pollution Associated with Lead Emitted from Piston-engine Aircraft

The Office of Air and Radiation's Office of Transportation and Air Quality (OTAQ) is currently evaluating, under section 231 of the Clean Air Act, whether lead emissions from aircraft operating on leaded aviation gasoline cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. This evaluation will lead to a determination as to whether the use of leaded fuel in such aircraft endangers public health and welfare. If this is the case, the office will issue engine emission standards to control lead emissions from these aircraft.

The use of leaded fuel in piston aircraft is the major source of lead air emissions with currently more than 400 tons of lead entering the atmosphere annually.Leaded gasoline fuels aircraft used for pilot training, business, personal transportation, recreation and many other applications, but it is not used in commercial jet and turbo-prop aircraft.

Section 231 of the Clean Air Act provides the EPA with the authority to regulate lead emissions from piston-engine aircraft if EPA finds leaded fuel causes or contributes to air pollution that may reasonably be anticipated to endanger public health or welfare. If the EPA were to make a positive endangerment finding for certain classes of aircraft engines, the EPA would then propose and establish lead emission standards to control lead emissions from these aircraft.

The EPA is currently planning to issue a proposed determination on the question of endangerment from lead emissions from piston aircraft in 2017 followed by a final determination in 2018. Separately, the FAA is evaluating unleaded fuels for use in the piston aircraft fleet and they plan to identify an unleaded replacement fuel by 2018 (see Section 7.5).

Website for more information:
https://www3.epa.gov/otaq/aviation.htm

7.11 Environmental Protection Agency – Office of International and Tribal Affairs and Office of Chemical Safety and Pollution Prevention: Global Elimination of Childhood Lead Poisoning from Lead in Paint

The EPA's Office of International and Tribal Affairs and Office of Chemical Safety and Pollution Prevention collaborate to help eliminate childhood lead poisoning by supporting the efforts of the Global Alliance to Eliminate Lead Paint (Lead Paint Alliance or the Alliance). The mission of the Alliance is to promote lead paint laws in every country by 2020 that would bring about the global phase-out of lead-based paint. The EPA has taken leadership in the Alliance, by increasing awareness regarding the health and economic impacts of childhood lead poisoning, developing a regulatory toolkit and model law that can be used around the world to foster lead paint regulations, and promoting the annual International Lead Poisoning Prevention Week of Action.

At this time seventy percent of the world's countries do not have laws to restrict lead in new paint. Concentrations of lead in new paint in these non-regulated countries often far exceed safe levels, with levels of lead content detected at more than 10,000 ppm. In contrast, the U.S. limit is 90 ppm. Globally, lead in paint is the major childhood source of exposure to lead.

Established in 2009 as a voluntary collaborative partnership of governments, private industry and non-governmental organizations, the Alliance has as joint secretariat the United Nations Environment Programme and the World Health Organization. The main objective of the Alliance is to prevent children's exposure to lead via lead-based paint by promoting the establishment of laws in countries where lead paint is still manufactured and commonly used.

Examples of the EPA's leadership and accomplishments within the Alliance include its work to create a broad-based, multi-stakeholder Advisory Group that helps govern and focus Alliance activities via a two-year action plan supported by all stakeholders. The EPA and the Centers for Disease Control and Prevention serve as co-chairs of the Alliance Advisory Group. The EPA has increased awareness of the economic costs of childhood lead poisoning globally, in part through its development of a web-based interactive map that improves access to economic impact data.

The EPA has spearheaded the development of the regulatory toolkit and a model law guide that are now forming the basis of Alliance workshops all over the world in which technical assistance is provided for the development of lead paint laws. The toolkit was launched in a sub-regional workshop in East Africa, with follow-up in Tanzania and Kenya to help develop laws in those countries. The laws in these two countries are anticipated to be the model for an East African Community standard that would phase out lead-based paint in five countries, as well as for other African countries and regions that are considering lead paint laws. The Alliance's annual International Lead Poisoning Prevention Week of Action is modeled upon a similarly-themed week in the United States. The event has garnered increasing participation with the number of events steadily growing from 57 in 2013 to over 100 in 2016. Regarding the longer-term goal of enacting lead paint regulations in all countries by 2020, the EPA is helping to achieve this goal by working with the Alliance to develop a strategic plan that seeks to include implementation assistance in countries around the world through 2025.

Websites for more information:
EPA web site: https://www.epa.gov/international-cooperation/epa-leadership-lead-paint-alliance
UNEP web site: http://www.unep.org/noleadinpaint
WHO web site: http://www.who.int/ipcs/assessment/public_health/lead/en/

7.12 Environmental Protection Agency – National Center for Environmental Economics: Improving Assessment of the Benefits of Lead Exposure Reductions

The EPA's National Center for Environmental Economics (NCEE) helps the agency better characterize the health benefits of lead exposure reductions in support of the EPA's lead regulatory activities. NCEE aims to improve the methodology the EPA uses to quantify and monetize the effects of lead exposure reductions in children and adults.

The EPA benefits analyses typically estimate the value of childhood lead exposure reductions using data on how average individual lifetime earnings are affected by lead-related decrements in IQ. NCEE is currently working on better characterization of the benefits of lead exposure reductions by including more of the adverse health effects associated with lead, potentially including additional neurodevelopmental outcomes, adverse birth outcomes and cardiovascular outcomes. Improved valuation for IQ decrements may also be considered.

7.13 Environmental Protection Agency – Office of Research and Development: Lead Research

EPA's Office of Research and Development (ORD) supports the agency's efforts to reduce childhood exposure to lead and the associated health impacts by conducting innovative research in several key areas. ORD research is focused on better understanding and characterizing population-level exposures to lead from multiple sources, such as soil, dust and water; furthering the scientific understanding of the human health effects of lead exposures, especially on sensitive populations such as children; and advancing the science on how best to mitigate lead exposure from different environmental sources. For example, projects include the evaluation of water chemistry adjustments to control lead leaching from pipes, analysis of lead bioavailability and risk from exposure to lead in soil, and development of improved approaches for the remediation of lead-contaminated soils. Other areas include drinking water technology research to address the unique needs of small communities in preventing lead contamination of drinking water, and community case studies that are evaluating the socioeconomic impacts of lead contamination at a large urban Superfund site. ORD's *Integrated Science Assessment for Lead*, published in 2013, provides a synthesis and evaluation of the most policy-relevant science to help determine if the current National Ambient Air Quality Standards for lead sufficiently protect public health and the environment. Selected ORD research activities on lead are described in more detail below.

Exposure research on lead includes the development of rapid, reliable and inexpensive methods for assessing the bioavailability of lead in contaminated soils and other matrices. The improved exposure data will be useful for evaluating exposure reduction strategies involving advanced soil remediation technologies. Other exposure work includes the generation of age-specific soil and dust ingestion estimates. Accurate soil and dust ingestion rates for all early life stages are needed to predict aggregate and cumulative exposures to a variety of chemicals found in these media. This effort will provide improved inputs to exposure and dose models, which will be useful for decisions involving the development of health-protective cleanup levels at Superfund sites. ORD is also modeling lead exposure from combined food and non-food (e.g., soil and dust) ingestion, water consumption, and inhalation, and comparing modeled results to real-world blood lead levels in local, regional and national case studies. The goal of this research is to better understand key exposure pathways and age-specific exposure risks.

Research on small drinking water systems is helping address the unique technological challenges facing many small communities. There are over 150,000 operational public drinking water systems. Of these, approximately 97% are considered "small systems" under the Safe Drinking Water Act (SDWA), meaning they serve 10,000 or fewer people. Research in this area is focused on evaluating novel technologies and sharing this information with communities and state agencies for their consideration of options for removing lead and other key contaminants without compromising the system's overall sustainability.

ORD is conducting research to improve treatment system practices governing the release of lead into drinking water. This effort is examining the effectiveness of phosphate treatment of different types and at different concentrations across a range of background water chemistries. The relative success of pH/alkalinity adjustment compared to phosphate treatment is also being studied. This information will help determine the necessity and cost-effectiveness of different levels of phosphate for drinking water treatment, assess of the potential benefit of lead service line removal relative to treatment, and evaluate the impact of pH/alkalinity adjustment or phosphate treatment on lead concentrations in drinking water.

Another ORD project is evaluating the long-term fate of lead in phosphate-treated waste materials to determine whether municipal solid waste landfills are a safe disposal option for these waste materials. Lead-rich wastes without treatment typically fail the toxicity characteristic leaching procedure (TCLP), an extraction method designed to simulate leaching through a landfill. Phosphate amendments have been demonstrated to react with lead in water to rapidly form an insoluble mineral called pyromorphite, which can form discrete precipitates or can become coated on lead-rich surfaces. This research will help determine whether phosphate amendments provide long-term protection for disposal in non-hazardous municipal landfills.

EPA's Engineering Technical Support Center (ETSC) is undertaking a socioeconomic analysis of a lead-impacted urban community. The Omaha NE Lead Site was added to the National Priorities List in 2003 and is one of the largest urban Superfund sites in the United States. Deposition of air emissions from historic lead smelting and refining operations resulted in surface soil contamination across the area. Cleanup and removal actions on the site began in 1999 at child care facilities, and have continued with 2600+ properties being remediated to date. The socioeconomic investigation is exploring potential associations between lead exposure and academic achievement and testing scores, as well as other potential health outcomes. This project will determine if there are societal impacts of lead exposure for those residing in and around the site.

Overall, EPA's research is advancing the science of lead in a variety of areas that are critical for minimizing population exposures to lead, and ultimately eliminating the associated health impacts.

Websites for more information:

Sustainable and Healthy Communities Research Program:
https://www.epa.gov/research/sustainable-and-healthy-communities-strategic-research-action-plan-2016-2019

Human Health Risk Assessment Research Program:
https://www.epa.gov/sites/production/files/2015-10/documents/strap_2016_hhra_508.pdf

Safe and Sustainable Water Resources Research Program:
https://www.epa.gov/research/safe-and-sustainable-water-resources-strategic-research-action-plan-2016-2019

Research on Small Drinking Water Systems:
https://www.epa.gov/water-research/small-drinking-water-systems-research-0

Integrated Science Assessment for Lead:
https://www.epa.gov/isa/integrated-science-assessment-isa-lead

7.14 Environmental Protection Agency – Office of Water and Office of Enforcement and Compliance Assurance: Reducing Lead in Drinking Water through Regulations, Enhanced Implementation and Enforcement

EPA's Office of Ground Water and Drinking Water (OGWDW) helps to reduce exposure to lead by developing and working collaboratively with the states and water sector stakeholders to implement regulations that measure the effectiveness of the treatment used by the public water system to minimize the presence of lead in drinking water. Lead is a critical drinking water contaminant that is subject to several EPA regulations. OGWDW is undertaking revisions to two important regulations, the National Primary Drinking Water Regulation (NPDWR) for Lead and Copper (the Lead and Copper Rule) and Regulations Implementing Safe Drinking Water Act (SDWA) section 1417: Prohibition on the Use of Lead Pipes, Solder and Flux. OGWDW's proposals for revisions will protect

public health by reducing the public's exposure to lead and copper in drinking water. In addition, the SDWA gives EPA the authority to delegate primary enforcement responsibility for public water systems to states, Indian tribes and territories if they meet certain requirements. OGWDW and the Office of Enforcement and Compliance Assurance work together to ensure effective implementation and enforcement of the regulation.

The **LEAD AND COPPER RULE (LCR)** is a treatment technique rule to help minimize water contamination, recognizing that there is no safe level of lead in drinking water, but it is not a health-based standard itself. Thus, it sets a health-based maximum contaminant level goal of zero for lead but does not set a maximum contaminant level (MCL) for lead. This differs from rules for other contaminants in that requirements focus on the application of treatment techniques instead of meeting an MCL for the water contaminant. The LCR requires public water systems (PWSs) to take certain actions to minimize lead and copper in drinking water including treatment to reduce water corrosivity and prevent the leaching of these metals from premise plumbing and drinking water distribution systems. When that isn't enough, the approach is to remove lead service lines that have been contaminating the water.

The current rule sets a target concentration or action level of 0.015 mg/L for lead and 1.3 mg/L for copper. An action level differs from an MCL in that an MCL is based on health effects and feasibility whereas an action level is a screening tool for determining when certain treatment technique actions are needed. As a treatment technique rule, the LCR action level is based on the practical feasibility of reducing lead through controlling corrosion. When using the LCR, if the action level is exceeded in more than ten percent of tap water samples collected during any monitoring period (i.e., if the 90th percentile level is greater than the action level), it is not a violation, but it does trigger other requirements that include water quality parameter monitoring, corrosion control treatment (CCT), source water monitoring/treatment, public education, and potentially lead service line replacement (LSLR). The public education requirements ensure that consumers in the affected area receive meaningful, timely, and useful information that is needed to help them limit their exposure to lead in their drinking water. If a PWS does not meet the requirements of the regulation as outlined above, then a violation occurs. Primacy agencies, as well as the EPA, have the authority to take enforcement action against a PWS with a violation.

In December 2015, the Agency received extensive recommendations from its National Drinking Water Advisory Council and other concerned stakeholders. The advice provided to the Administrator included the recommendation that EPA develop a health-based "household action level" for lead in drinking water. The LCR does not currently include such a health-based value. EPA will carefully evaluate these recommendations, recommendations of the Agency's Science Advisory Board, national experience in implementing the rule, and the experience in Flint to develop a proposed revision to the rule. EPA currently expects this proposal to be published for comment in 2017.

As part of Agency's ongoing effort to improve nationwide implementation of and compliance with the current LCR, EPA has been working with states, public water systems, and water sector stakeholders to identify challenges and promote best practices. Based on input received, EPA has issued memoranda, technical recommendations, and provided online and in-person trainings and workshops. In addition, the Agency is working closely with the primacy agencies to enhance oversight activities to identify implementation challenges and address deficiencies.

The **2011 REDUCTION OF LEAD IN DRINKING WATER ACT (RLDWA)** modified the SDWA to reduce the allowable lead concentration in new pipes and plumbing devices from 8.0% to a weighted average of 0.25% across the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures, and 0.2% of lead for solders and fluxes. The RLDWA became effective January 4, 2014, and the law's requirements are already in effect. EPA is preparing a proposed rule to codify the new definition of lead free and to clarify how manufacturers can demonstrate they meet the new lead free standards that have been put in place by the RLDWA.

EPA'S 3TS FOR REDUCING LEAD IN DRINKING WATER IN SCHOOLS (3TS) was developed to assist schools or child care centers with lead in drinking water prevention programs as part of the school's or center's overall plan for reducing environmental threats. It includes a training, testing and telling approach. The document introduces tools to train personnel on the importance of lead in drinking water; to test drinking water in schools, interpret the results and decide on the appropriate remediation; and to effectively communicate with, or tell, the parents, staff and school community. EPA will continue to work with other EPA offices and school stakeholders to provide trainings and up-to-date information to better assist schools and childcare facilities in their efforts to reduce lead in drinking water.

Websites for more information:
Basic Information about Lead in Drinking Water:
https://www.epa.gov/dwreginfo/lead-drinking-water-schools-and-child-care-facilities
Information about the NPDWR for Lead and Copper: https://www.epa.gov/dwreginfo/lead-and-copper-rule
Information on section 1417 of the SDWA:
https://www.epa.gov/dwstandardsregulations/section-1417-safe-drinking-water-act-prohibition-use-lead-pipes-solder-and
The 2009 Drinking Water Enforcement Response Policy and the Enforcement Targeting Tool prioritize and direct enforcement responses at drinking water systems with significant unresolved serious, multiple, or continuing violations. EPA remains vigilant about enforcement noncompliance that has the potential to effect children, such as violations at schools and daycare facilities.

7.15 Environmental Protection Agency – Office of Enforcement and Compliance Assurance: Providing Outreach, Improving National Consistency in the Lead-Based Paint Inspection Program, and Identifying Priority Areas for Inspections

OECA helps prevent childhood lead exposure by providing coordination and educational activities related to the lead-based-paint inspection program. OECA hosts a monthly lead inspector practitioners' call to promote national consistency in the lead-based-paint inspection program. Based on topics discussed on each call, OECA creates guidance, training or other tools to ensure that inspectors are using the same procedures to target and conduct inspections. Additionally, OECA and regional offices drafted compliance assistance letters to the approximately 3,500 local public housing authorities to educate them on the lead-based paint rules and to remind them of their responsibility to comply with those rules. This will help decrease exposures to vulnerable populations living in pre-1978 public housing. These compliance assistance letters were mailed in early July 2016.

OECA receives electronic national building permit data that can be used by the EPA and various local authorities and stakeholders who do work related to lead-based paint inspections to target inspections where renovations or repairs are currently occurring in pre-1978 housing. During the inspections, inspectors may provide compliance assistance to contractors to help them come into compliance with the Renovation, Repair, and Painting (RRP) rule to reduce childhood lead poisoning.

This program has a number of beneficial impacts. In the short-term, EPA inspections and enforcement actions encourage contractors to come into compliance and thus can immediately decrease the potential for lead contamination on RRP projects. Intermediate-term impacts stem from increased awareness among the regulated community that the EPA is actively inspecting for compliance with lead regulations. Longer-term impacts are an overall increase in compliance and safer renovation practices within the regulated community as their understanding of their role in lead exposure prevention grows. Further, these efforts will improve national consistency in the lead-based-paint inspection program, improve communication between inspectors and foster creative solutions to problems encountered in the field. The lead inspector practitioners calls enable EPA Headquarters to be more responsive to regional needs to continuously improve the lead-based paint program.

Websites for more information:
https://www.epa.gov/lead
http://www.cicacenter.org/
https://www.epa.gov/compliance/compliance-monitoring-strategy-toxic-substances-control-act-tsca
https://www.epa.gov/compliance/toxic-substances-control-act-tsca-compliance-monitoring
https://www.epa.gov/enforcement/waste-chemical-and-cleanup-enforcement#chemical
https://www.epa.gov/ejscreen

7.16 Environmental Protection Agency – Office of Air and Radiation: Review and Implementation of the National Ambient Air Quality Standards for Lead

The EPA's Office of Air and Radiation helps protect children from harmful lead exposure by setting air quality standards for lead that protect public health and also requiring monitoring to assess compliance with the standards and the development of plans to improve air quality in areas not meeting the standard. The manner in which the Office of Air and Radiation has established and implemented the lead standards in recent years is described below.

Lead is one of the pollutants for which the EPA sets national ambient air-quality standards (NAAQS) under the Clean Air Act (CAA). The primary (health-based) standard for lead is established to protect public health with an adequate margin of safety and is periodically reviewed and, as appropriate, updated. The EPA requires state and local agencies to monitor near sources that have the potential to exceed the lead NAAQS, and the EPA analyzes the monitoring data to assess compliance. For areas that do not meet the lead NAAQS (nonattainment areas), the CAA requires states to draft a plan that outlines the measures that the state will take to improve air quality and meet the standard. In 2008, EPA substantially revised the NAAQS for lead, lowering the level of the standard by a factor of 10 to 0.15 micrograms per cubic meter three month average of lead in total suspended particles. The revised standard increased protection for children and other at-risk populations against an array of lead's adverse effects, most notably neurocognitive and neurobehavioral effects in children. EPA recently reviewed the 2008 standards and determined in September 2016 that the existing standards provide the requisite protection of public health and welfare.

In 2008 and 2010, the EPA revised the monitoring requirements to ensure that monitoring occurs near large lead sources. Based on data collected at the previously existing and newly required monitoring sites, 21 areas are currently designated nonattainment under the current standards. In the most recent three-year period for which data are available (2013–2015), 10 of the 21 have air quality that meets the standards. Implementation activities are continuing to bring all areas into compliance with these standards.

The monitoring data reflect the more localized nature of lead air concentrations since the removal of lead from motor vehicle gasoline. These data show that concentrations exceeding the NAAQS are found in localized areas near sources and decline within very short distances from such sources. Implementation of the final 2008 lead NAAQS is ongoing and EPA continues to track progress on air-quality improvements in attainment areas

initially judged in nonattainment. The EPA, through its headquarters and regional offices, will continue to provide implementation related guidance and support to states to ensure their control strategies address lead emissions to ensure timely attainment and maintenance of the lead NAAQS.

Website for more information:
https://www.epa.gov/lead-air-pollution

7.17 Department of Health & Human Services – Administration for Children and Families: Child Care and Development Fund

The Child Care and Development Fund (CCDF) is the largest source of federal funding to help pay for child care for low-income working parents, providing $5.7 billion in FY2016 to states, territories and tribes to administer. 1.4 million children under age 13 from almost 1 million low-income working families are served by CCDF each month. The program's authorizing statute, the Child Care and Development Block Grant Act, of was reauthorized in 2014 and made expansive changes focused on improving the health and safety of children in early care and education, improving subsidy policy for families and providers, promoting consumer education and improving the overall quality of programs. For child care providers serving children funded by CCDF, section 658E(c)(2)(I)(i)(V) of the Act requires states to have in effect health and safety requirements and training that include "building and physical premises safety." Though not explicitly required, ACF lead testing and mitigation should be encouraged under this section.

7.18 Department of Health & Human Services – Administration for Children and Families: Early Head Start Child Care Partnerships Funding Opportunities

The Administration for Children and Families (ACF) supports states and communities as they expand high-quality, early-learning opportunities to infants and toddlers through EHS Child Care Partnerships. EHS Child Care Partnerships promote early childhood development by providing grants for EHS programs to partner with local child care centers and family childcare providers serving infants and toddlers from low-income families. The partnerships support working families by providing a full-day, full-year program where they receive comprehensive services that benefit children, families and teachers. These services include health, developmental and behavioral screenings, including screening for exposure to lead, increased professional development opportunities for teachers and increased parent engagement opportunities. EHS Child Care Partnerships provide comprehensive services that include behavioral health, general health, and nutrition services. To meet and comply with program requirements, EHS Child Care Partnership programs must ensure that all children receive a blood lead toxicity screening per the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program of the Medicaid agency of their state. In addition, EHS Child Care Partnership programs provide parent-education activities and staff training relevant to lead poisoning and toxic stress.

Website for more information:
https://www.acf.hhs.gov/programs/ohs

7.19 Department of Health & Human Services – Administration for Children and Families: Early Head Start and Head Start Services

Early Head Start/Head Start (EHS/HS) helps to prevent the adverse effects of childhood lead exposure by ensuring that all children within their program undergo blood lead screening, by providing health and nutrition services and by providing education and training relevant to lead poisoning.

EHS/HS is a federal program that promotes the school readiness of children from birth to age 5 years from low-income families by promoting their cognitive, social and emotional development. More than a million children are served by Head Start programs every year, including children in every U.S. state and territory and in American Indian and Alaska Native communities.

With respect to reducing lead exposure, EHS/HS provides comprehensive services that include behavioral health, general health and nutrition services. To meet and comply with Head Start Program Performance Standards, Head Start programs must ensure that all children receive a blood lead toxicity screening per the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program of the Medicaid agency of their state. In addition, EHS/HS provides parent-education activities and staff training relevant to lead poisoning and toxic stress.

Website for more information:
https://www.acf.hhs.gov/programs/ohs

7.20 Department of Health & Human Services – Administration for Children and Families (ACF): Guidance on Basic Health and Safety Standards for Early Care and Education for State Child Care Licensing and Quality Rating Improvement Systems

ACF promotes health-protective safety standards, including lead testing in children and other measures described in *Caring for Our Children Basics: Health and Safety Foundations for Early Care and Education*. Though voluntary, the ACF hopes *Caring for Our Children Basics* will be a helpful resource for LEAD-BASED PAINT ACTIVITIES PROGRAM and other entities as they work to improve health and safety standards in childcare licensing and which would be reflected in Quality Rating Improvement Systems (QRIS). Regarding lead testing, *Caring for Our Children Basics* (Section 5.1.1.5) includes the recommendation that an environmental audit that includes an evaluation of lead on the premises be conducted at early childhood settings, with remediation of sites where children's health could be affected.

ACF hopes *Caring for Our Children Basics* will provide a common framework for improved monitoring systems and will assist childcare-licensing agencies achieve a more consistent high-quality foundation upon which families can rely. ACF hopes the inclusion of an environmental audit will prevent lead exposure in children who attend licensed childcare programs. ACF also sees *Caring for Our Children Basics* as an educational tool at the program level.

Websites for more information:
https://www.acf.hhs.gov/programs/ecd/caring-for-our-children-basics
https://www.acf.hhs.gov/sites/default/files/ecd/caring_for_our_children_basics.pdf

7.21 Department of Health & Human Services – Administration for Children and Families: Memorandum of Understanding between EPA Region 2 and HHS Region 2

The EPA and the Administration for Children and Families (ACF) are jointly helping prevent childhood lead exposure through a Memorandum of Understanding (MOU) in which regional offices cooperate on a variety of projects involving the evaluation of environmental conditions at Head Start and childcare programs. The MOU establishes a framework for cooperation to improve the health of children and relevant staff in New Jersey, New York, Puerto Rico, the U.S. Virgin Islands and Tribal Nations. The EPA and ACF are working together to disseminate information that can inform future siting of facilities as well as improve existing environmental conditions. Two of the conditions that can directly impact children's exposure to lead are lead-based paint and lead in drinking water.

To address lead-based paint, the MOU tasks the EPA Region 2 office to provide guidance documents and technical assistance for lead-based paint in child-occupied facilities. The ACF Region 2 office will disseminate these materials to promote safe practices whenever facilities staff do work or hire a contractor that might disturb painted surfaces in child-occupied facilities. Further, EPA Region 2 will provide a webinar for ACF staff and staff of Head Start programs on the relevant regulatory requirements concerning lead-based paint. ACF Region 2 will promote awareness of the EPA's Renovation, Repair and Painting rule and how it can affect early care and education facilities. Further, ACF will assist the EPA in disseminating information about the health effects of childhood lead exposure and tools to assist childcare and Head Start programs locate certified Lead-Safe construction professionals in their area.

Regarding lead in drinking water, the MOU calls for ACF Region 2 to provide EPA Region 2 with a list of all Head Start facilities and their locations within the region. EPA Region 2 will determine whether the public water supplying these facilities is in compliance with the EPA's Lead and Copper Rule and provide this information to ACF and/or the facilities. EPA Region 2 will develop and implement a plan to inspect those Head Start and childcare centers that will be tested for lead in drinking water and then develop a generic sampling plan to assist these facilities in identifying which outlets should be tested for lead, for example those normally used for drinking and food preparation. EPA Region 2 may share or develop checklists for the evaluation of lead in drinking water (e.g., plumbing profile questionnaire, list of banned water coolers, flushing logs) and will work collaboratively with ACF and Head Start programs on a remediation plan if results indicate high levels of lead in the drinking water.

EPA Region 2 will work with ACF to raise awareness about lead in drinking water, with outreach to Head Start and childcare staff and enrolled children and their families. The outreach materials may include various electronic and print media, existing guidance documents for reducing lead in drinking water, as well as EPA-sponsored toll-free hotlines and websites, such as the Safe Drinking Water Hotline and Consumer Information line at 1-800-424-LEAD.

EPA Region 2 will encourage partnerships among ACF, state and local agencies, public-water systems and other interested stakeholders working toward reducing lead in drinking water in Head Start, family child care, and center-based childcare settings. These partnerships will be promoted at national, state and local conferences such that progress on the activities and successes of the Head Start initiative on reducing lead in drinking water will become widely shared.

Website for more information:
https://www.epa.gov/dwreginfo/lead-drinking-water-schools-and-child-care-facilities#tab-4

7.22 Department of Health & Human Services – Administration for Children and Families: Outreach to Head Start and Child Care and Development Fund Grantees on Lead Exposure in Children

The Administration for Children and Families (ACF) helps address childhood lead exposures by increasing awareness of lead hazards among the public and as part of the professional development of early-care educators and providers. This outreach is accomplished through the promotion of federal resources on lead prevention to programs and families served.

These resources include:

- EPA website: Lead in Drinking Water at Schools and Child Care Facilities https://www.epa.gov/dwreginfo/lead-drinking-water-schools-and-child-care-facilities
- EPA's 3T's for Reducing Lead in Drinking Water in Child Care Facilities: Revised Guidance https://www.gslabs.com/3ts_leadschools.pdf
- Lead Poisoning Prevention for Head Start Children: Tips and Resources for Programs to Meet the Lead Screening Requirement https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/physical-health/education-activities/lead-poisoning-prevention.html
- How to Protect Your Child from Lead Poisoning https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/docs/lead-brochure-english.pdf
- Strategies for Meeting the Lead Screening Requirement in Head Start https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/docs/sequence-steps-address-lead-screening-04.pdf
- Lead Screening: Well Child Health Care Fact Sheet https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/safety-injury-prevention/environ-protection-efforts/health_fts_00748_072905.html
- Childhood Lead Prevention Program: State Programs https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/safety-injury-prevention/environ-protection-efforts/ChildhoodLeadPo.htm
- 10 Tips to Protect Children from Pesticide and Lead Poisoning https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/safety-injury-prevention/environ-protection-efforts/TipstoProtectC.htm

ACF also promotes the use of the National Center for Early Childhood Health and Wellness Webinar on Nutrition to Mitigate the Effects of Lead Poisoning. This webinar provides information on how Early Care and Education nutrition standards support lead prevention efforts while providing resources to families and ways to bring community resources together to ensure childhood lead screening.

Website for more information:
https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health

7.23 Department of Health & Human Services – Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry: Conducting Public Health Assessments on Lead Exposure

The Agency for Toxic Substances and Disease Registry (ATSDR) helps decrease childhood lead exposures by providing public health assessments, exposure investigations, health consultations and technical support related to community exposure to a wide range of toxic chemicals including lead. The manner in which ATSDR's efforts help improve public health are coordinated with other agencies are described below.

ATSDR was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the Superfund law. ATSDR is a non-regulatory, environmental health agency that provides public health expertise to keep Americans safe from hazards in the environment. ATSDR staff in 10 regions, along with headquarters staff, interface with petitioners for public health assessments that explore the relationship between environmental factors in air, water and other

media and community health. ATSDR provides health consultations related to these investigations and, in addition, engages in emergency preparedness and response activities.

One example of ATSDR's impact with respect to lead exposure is the agency's investigation at a former lead and silver smelter in Pueblo, Colorado. At this site, ATSDR identified children with elevated levels of lead in their blood. ATSDR and the local health department connected these children with needed medical care and provided the EPA with their results to help them target soil replacement in places where it was most needed to protect children.

ATSDR also promotes innovative health education and outreach events called "soilSHOPs" – Soil Screening, Health Outreach and Partnerships – to help people learn if their soil is contaminated with lead or other metals and how to reduce exposures to contaminated soil and produce from community and urban gardening. At soilSHOP events, ATSDR provides free soil screening for lead and other harmful chemicals; information on safe gardening practices and ways to protect children from lead exposure; and one-on-one health education about lead and other harmful chemicals. ATSDR has developed a toolkit to help communities and other groups plan their own soilSHOP events.

Websites for more information:
https://www.atsdr.cdc.gov/soilshop/
https://www.atsdr.cdc.gov/hac/coloradoslag.html

7.24 Department of Health & Human Services – Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry: Guidance on Choosing Safe Places for Child Care

ATSDR promotes the consideration of potential exposures to harmful chemicals when choosing a location for a childcare center. By adopting policies and practices that encourage partnerships and identify potentially problematic sites before siting a childcare center, states and childcare providers can prevent harmful exposures, such as lead in soil, to young children.

ATSDR plans to release voluntary guidelines to help state governments and other entities learn about chemical-exposure concerns associated with childcare center locations and identify options for addressing this issue through policies and practices. Although an estimated 8.3 million children may be in licensed childcare centers across the country, the majority of state licensing processes do not require site assessments to identify potential exposures to chemicals present on the site from past use of the site or coming onto the childcare site from nearby sites. The ATSDR guidelines can help prevent lead and other environmental exposures to children by ensuring that these exposures are carefully considered and mitigated in all childcare centers.

7.25 Department of Health & Human Services – Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry: Geospatial Research, Analysis, and Services Program (GRASP) Support for Site-Specific Lead Investigations and Response

ATSDR's GRASP unit helps prevent lead exposures by providing mapping, modeling and spatial analyses that help investigators understand the environmental and population risk factors that govern children's exposure to lead. These analyses have been used around the country at lead-related health investigations including in Flint, Michigan. Additional examples and applications are described below.

GRASP uses geographic information system techniques to provide geospatial analyses and maps that enable ATSDR scientists to assess environmental, sociodemographic and behavioral issues affecting chemical exposure at hazardous waste sites across the United States. GRASP maps are essential in ATSDR's efforts to communicate complex health information to communities, government partners, academia and advocacy groups.

Applications of GRASP that are pertinent to childhood lead assessments are the mapping and spatial analysis of blood lead levels in a region in relation to lead-contaminated media, the mapping of childhood lead-exposure risk factors and providing an estimate of the denominator (at-risk population) in study areas. GRASP products are useful in a variety of education and outreach settings, including to healthcare providers and prevention services, to map health resources in a region and to provide visuals for posters, publications, fact sheets and public presentations. GRASP is also useful from a surveillance and monitoring perspective, for example, in analysis of school attendance in relation to educational outcomes.

To date, GRASP has supported more than 30 lead-related health investigations. In Miami, Oklahoma, GRASP mapped soil lead results in public parks and other locations, showing that soil lead levels could expose children to lead; this information resulted in zoning changes. A study in Evansville, Indiana, mapped more than 10,000 blood lead samples of young children in relation to children's homes and the age of housing. This showed a clear trend of elevated blood-lead levels in children living in pre-1970 homes, which assisted in promoting lead-safe housing policies. In Philadelphia, Pennsylvania, GRASP is comparing children's blood-lead levels to environmental samples from homes near historic lead-emitting factories to help improve cleanup strategies. GRASP provided support for investigators in Flint, Michigan, by creating reference maps that showed locations and lead levels for thousands of drinking water samples, housing characteristics and demographic data. This enabled officials to understand the relationship between water distribution and lead levels.

Website for more information:
https://www.atsdr.cdc.gov/dthhs/office_of_director/grasp.html

7.26 Department of Health & Human Services – Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry: Toxicological Profile for Lead

ATSDR's Toxicological Profile for Lead is part of the effort to prevent lead's adverse effects by being a key resource to the scientific community. The profile improves understanding of the toxic effects of lead and the factors that increase vulnerability. A planned update by ATSDR will further increase its utility as a leading scientific resource in this area.

The Comprehensive Environmental Response, Compensation and Liability Act section 104(i), as amended by the Superfund Amendments and Reauthorization Act, requires ATSDR to develop a toxicological profile on each substance that is on the priority list of hazardous substances. The list is based on a combination of a chemical's frequency of detection, toxicity and potential for human exposure at National Priorities List sites. Lead is No. 2 on the priority list, and the lead toxicological profile was most recently updated in 2007.

The toxicological profiles are peer-reviewed and include a review, interpretation and summary of available toxicological and epidemiological information on a hazardous substance to ascertain the levels of significant human exposure. This analysis requires ATSDR to determine whether adequate information is available to make health determinations for acute, subacute and chronic health effects. Where there are data gaps, ATSDR identifies the toxicological testing needed to fill these gaps and thus enable a more complete assessment.

An updated toxicological profile for lead will be initiated in 2016 that will integrate more recently published studies (beyond 2007) on exposure and effects of lead with a focus on recent studies showing adverse effects occurring at blood lead levels less than 10 micrograms per deciliter.

Website for more information:
https://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=96&tid=22

7.27 Department of Health & Human Services – Centers for Disease Control and Prevention/National Center for Environmental Health: Healthy Homes/Lead Poisoning Prevention Program (HHLPPP)

The National Center for Environmental Health (NCEH) funds state and local health departments to develop blood lead surveillance systems and to make the data available to decision makers and stakeholders. The surveillance system also evaluates whether services provided to children with elevated blood lead levels are timely and appropriate. These efforts are helping reduce healthcare costs and improve academic achievement and later life success for at-risk children.

NCEH 2016 funding will be awarded to state and local health departments who are in the final year of a three-year cooperative agreement. The surveillance data are critical to state, local and federal efforts to control or eliminate lead sources in children's environments before they are exposed (primary prevention). The funded programs collect and analyze data to identify the highest risk areas and sub-populations and then work with partners to target preventive measures such as housing rehabilitation, code enforcement and early childhood education in these high-risk areas.

Recent accomplishments include publishing recommendations on educational interventions for children affected by lead, adopting an upper reference-range value for blood lead levels in children ages 0–6 years based on the distribution of blood lead in U.S. children and deploying a web-based data system that supports local and state surveillance activities and interventions for children with elevated blood lead levels. In addition, HHLPPP has developed and disseminated protocols and training materials for conducting small-area, lead prevalence studies. These materials have been used in the United States and many other countries to identify emerging lead hazards for children and guide efforts to reduce these hazards. HHLPPP is also a member of the Global Alliance to Eliminate Lead Paint and supports the Alliance's efforts to ban the use of lead paint worldwide.

Website for more information:
https://www.cdc.gov/nceh/lead

7.28 Department of Health & Human Services – Centers for Disease Control and Prevention: Lead Poisoning Prevention Subcommittee of the NCEH/ATSDR Board of Scientific Counselors

The NCEH/ATSDR Board of Scientific Counselors (BSC) is helping address lead exposures through its Lead Poisoning Prevention Subcommittee, which provides expertise and guidance to CDC/ATSDR. The BSC is a

16-member advisory committee chartered under the Federal Advisory Committee Act, which provides guidance to the Secretary of the Department of Health & Human Services, the Director of the CDC and the Director of NCEH/ATSDR. BSC guidance assists in ensuring scientific quality, timeliness, utility and the dissemination of results.

In 2015, the BSC established a Lead Poisoning Prevention (LPP) Subcommittee composed of a wide range of external lead-poisoning-prevention experts. The CDC anticipates engaging both the BSC and the LPP Subcommittee as staff evaluate data from the National Health and Nutrition Examination Survey for its possible impact on the CDC reference value for blood lead in children.

Website for more information:
https://www.atsdr.cdc.gov/science/index.html

7.29 Department of Health & Human Services – Centers for Disease Control and Prevention/National Center for Environmental Health: National Biomonitoring Program

The National Biomonitoring Program helps in the detection, diagnosis, treatment and prevention of lead-related disease by improving methods to test for blood lead in human populations including young children, by characterizing lead levels across the U.S. population, by helping to establish CDC's reference level for elevated blood lead, by providing quality-assurance expertise and funding to support the national infrastructure for blood lead monitoring and by providing status and trends data, which helps identify changes in population lead levels over time in response to interventions to reduce lead exposure.

The program has improved laboratory methods for measuring lead in human blood and urine and has applied these methods to assess the U.S. population's exposure to lead in participants from the National Health and Nutrition Examination Survey beginning with children age 1 year and older. These results are published in the *National Report on Human Exposure to Environmental Chemicals*. The methods developed by the National Biomonitoring Program yield high-quality lead measurements for collaborative studies that examine vulnerable populations, such as newborns, children, pregnant women and groups with known or potentially high exposures.

The program has also contributed to the development of portable (point of care) blood lead analyzers that assess lead exposures and identify poisoning incidents even in remote locations. A collaboration with the National Institute of Standards and Technology has produced validated standard reference materials for lead in both blood and urine. These reference materials ensure that laboratory analyses of lead from a variety of programs including national surveys, epidemiology research and environmental exposure testing are valid. The National Biomonitoring Program offers quality-assurance services and technical assistance to domestic and international laboratories that measure lead in whole blood, and it funds state public health laboratories to assess lead and other chemical exposures of concern in their communities. This expands the national capacity to conduct high-quality biomonitoring for lead and other chemicals.

In addition to current work addressing the quantification of lead exposure, the CDC will continue efforts to assess national population estimates used in regulatory and public health decision-making and that inform the CDC's blood lead reference levels. These reference levels are used to identify children with elevated blood lead

that require intervention. The biomonitoring program's tracking of lead in Americans over time helps to rapidly identify changes in exposures to at-risk populations (e.g., children and pregnant women), which may occur in response to public health interventions to reduce exposures. Thus, the biomonitoring program can help identify the effectiveness of such interventions.

Websites for more information:
https://www.cdc.gov/biomonitoring
https://www.cdc.gov/exposurereport
https://www.cdc.gov/biomonitoring/state_grants.html

7.30 Department of Health & Human Services – Centers for Medicare & Medicaid Services (CMS)/Center for Medicaid and CHIP Services: Blood Lead Screening for Children Enrolled in Medicaid

The Medicaid program helps to prevent childhood lead poisoning by identifying children with exposure to lead at the age when at most risk. The program helps assure that such children receive any necessary follow-up, including diagnostic or treatment services.

Blood lead testing is a covered service for children enrolled in the Medicaid program through the Early and Periodic, Screening, Diagnostic and Treatment benefit. All children enrolled in Medicaid are entitled to receive a screening blood lead test at 12 and 24 months of age. Children who did not receive a test by age 2 years are entitled to receive a test up to age 6 years. States include blood lead screening results for children who receive Medicaid in the data that they submit annually to CMS. States may submit a proposal to target lead screening to areas of greatest risk and then implement a targeted screening program if approved. The Medicaid program also includes coverage of lead investigations in a child's home or primary residence.

Website for more information:
https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

7.31 Department of Health & Human Services – Food and Drug Administration/ Center for Food Safety and Applied Nutrition: Monitoring Domestic and Imported Foods for Unsafe Levels of Lead and Developing Regulations or Guidance to Establish Appropriate Maximum Lead Levels in Foods

The Food and Drug Administration's (FDA) Center for Food Safety and Applied Nutrition carries out monitoring of foods and foodware (tableware such as plates, serving bowls and drinking utensils) to limit consumer exposure to lead. The FDA monitors imported and domestic foods and tableware for lead levels through its regulatory monitoring program (Toxic Elements in Food and Foodware compliance program) and its Total Diet Study. The FDA takes action to ensure the removal of contaminated food and unsuitable tableware from the marketplace, when necessary, or to prevent foods with elevated levels of lead from reaching consumers. The FDA also establishes limits by regulation or by guidance to ensure that processors use good manufacturing practices to manufacture tableware and to avoid the introduction of lead during food production. In addition, the FDA provides technical assistance to state and local agencies as they assess potential exposure to sources of lead within their areas of jurisdiction, such as restaurants and retail food establishments. The FDA also responds to requests for information regarding lead and food safety and ensures that public messaging is properly coordinated and cleared and consistent with other federal and state agencies.

7.32 Department of Health & Human Services – Food and Drug Administration/ Center for Food Safety and Applied Nutrition: Decrease the Codex Maximum Levels for Lead in Various Foods Through the Codex Committee on Contaminants in Food

The FDA is helping reduce lead exposure in the general population by leading a multi-year effort to lower maximum levels (MLs) for lead in various foods in the Codex Alimentarius General Standard for Contaminants and Toxins in Food and Feed. This effort will help decrease the amount of lead in foods around the world.

The FDA is the primary agency on the U.S. Delegation to the Codex Committee on Contaminants in Food (CCCF), which has proposed lowering the lead MLs in response to a new assessment by the World Health Organization and Food and Agriculture Organization, indicating that it was not possible to establish a tolerable weekly intake for lead that would be considered to be health protective. When the work began in 2012, many of the MLs in the General Standard were outdated, reflecting historically higher levels of lead in food from environmental exposures impacted by widespread use of leaded gasoline and lead-soldered cans. Over the past several years, through the work of the CCCF, Codex has lowered MLs for approximately 10 food types. In April 2016, the CCCF discussed lowering MLs for lead for 13 additional food types.

Lower Codex MLs are important because many countries use Codex MLs as their own standards for allowable levels of contaminants in food. The lower MLs should result in lower concentrations of lead in food worldwide, as well as adoption of better manufacturing and agricultural practices to reduce lead contamination.

Websites for more information:
www.fao.org/fao-who-codexalimentarius/en/
www.fao.org/fao-who-codexalimentarius/meetings-reports/detail/en/?meeting=CCCF&session=10 (Agenda Item 6.1 EN)

7.33 Department of Health & Human Services – Health Resources and Services Administration/Bureau of Primary Health Care: National Training and Technical Assistance/Cooperative Agreement

The National Training and Technical Assistance Cooperative Agreements program helps prevent childhood lead exposure by providing free training and technical assistance (T/TA) to health centers that participate in the program. T/TA informs health centers and other stakeholders of the health consequences of lead exposure and the optimal methods to prevent lead poisoning. The program provides state/regional/national trainings via in-person events such as regional forums as well as through distance learning such as webinars. The program also maintains websites and provides newsletters and fact sheets that serve as educational tools for the public and providers.

These resources are data driven, cutting edge and focused on quality and operational improvement to support Health Center Program award recipients and look-alikes. Federally Qualified Health Center Look-Alikes are health centers that have been certified by the federal government as meeting all the Health Center Program requirements, but do not receive funding under the Health Center Program.

T/TA needs are designed according to the needs of the populations served by the health centers. Examples of activities specifically addressing lead poisoning-related issues include the Community Health Partners for Sustainability training, Lead Poisoning – Why Some Kids are Still at Risk – October 2015; the School-Based Health Alliance training, Engaging SBHCs (School-Based Health Centers) in Reducing Environmental Asthma Triggers – October 2015; and the National Center for Health in Public Housing training, Lead Prevention Webinar – Highlighting Policies and Best Practices – Fall 2016.

Website for more information:
http://bphc.hrsa.gov/qualityimprovement/strategicpartnerships/ncapca/natlagreement.html

7.34 Department of Health & Human Services – Health Resources and Services Administration (HRSA)/Maternal and Child Health Bureau: Reproductive and Environmental Health Network Program at the Organization of Teratology Information Specialists

The Organization of Teratology Information Specialists (OTIS) helps provide the most current information to the public and healthcare professionals on the possible developmental risks from lead and other teratogens. Through a cooperative agreement in 2014, the OTIS updated a fact sheet on lead exposure in response to the increased demand for information and is working to expand lead activities nationwide by developing additional resources for women who are pregnant or breastfeeding.

The OTIS supports regional Teratology Information Services that provide one-on-one risk assessments and counseling to pregnant and breastfeeding women and to providers on known and potential reproductive risks, including lead exposure. Additional activities include maintaining a website and app that serve as educational tools for the public and providers, producing educational fact sheets including one detailing lead exposure, conducting educational events through distance and in-person events and through teaching of health-care professionals. The Reproductive and Environmental Health Network also improves access to teratogen information services to vulnerable and hard-to-reach populations.

Website for more information:
https://mothertobaby.org/fact-sheets/lead-pregnancy/pdf

7.35 Department of Health & Human Services – Indian Health Service: Provision of Comprehensive Public Health Services to Tribes to Ensure Safe Drinking Water, Heathy Homes and Children's Environments

The Indian Health Service (IHS) helps prevent childhood lead exposure by addressing lead in the environment of American Indian and Alaska Native (AI/AN) children as part of a comprehensive public health program. The IHS ensures settings for AI/AN children are safe and provide healthy environments in which to live, learn, play and grow. Staff help identify health issues through inspections and investigation of children's environments and health conditions and then make suggestions for corrective action.

The IHS delivers public health services to federally recognized tribes located in 12 administrative areas, constituting more than two million members of the AI/AN community. Children's environmental health issues are present in schools, Head Starts, childcare facilities, community settings and housing and include indoor air quality, lead and other toxics exposure, as well as vector-borne and infectious diseases.

Through clinical referrals or routine inspections and investigation of health conditions related to environmental exposures, IHS staff identify hazards in child-occupied facilities and provide recommendations for corrective actions to reduce risk to children. The IHS also provides training and outreach to federal and tribal staff and community members on environmental health factors and consults on program planning and policy development. The IHS partners with agencies such as the EPA through inter-agency agreements, committees and workgroups to conduct specific projects to improve children's environments related to lead and other environmental hazards.

While IHS does not have a national lead initiative, it does include reducing lead in children's environments as part of a comprehensive public health program that addresses motor-vehicle accidents and injuries, arsenic, radon, Hantavirus, Zika Virus, West Nile Virus, Plague, asthma and other issues.

Websites for more information:
www.ihs.gov
www.ihs.gov/dehs

7.36 Department of Health & Human Services – National Institutes of Health/ Eunice Kennedy Shriver National Institute of Child Health and Human Development: Research on the Effects of Lead Across the Lifespan

The Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) helps improve understanding of lead effects across the lifespan by supporting research on a variety of developmental endpoints and life stages. This includes pregnancy and fetal development, early childhood, adulthood, aging and trans-generational effects. For example, NICHD supports the National Longitudinal Study of Youth, which can provide data on lead effects on behavior in children and adolescents. In addition, the Population Dynamics Branch supports research grants that look at how health disparities may affect vulnerability to high blood lead levels.

Research supported by NICHD has already shed light on the developmental and cognitive effects of lead exposure, with some unexpected results. For example, exposure to lead in childhood may delay the onset of puberty in young girls. Less is known about the impact of lead exposure on learning and cognition across the lifespan, beginning in pregnancy. Currently funded research is examining this issue, which will provide a basis for potential future interventions and treatments.

NICHD is exploring options to expand the knowledge base of lead effects on different organ systems at different ages, and to identify where the research gaps and opportunities may exist.

Website for more information:
https://www.nichd.nih.gov search for lead exposure

7.37 Department of Health & Human Services – National Institutes of Health/ National Institute of Environmental Health Sciences: Data Review and Monograph on Lead

The National Institute of Environmental Health Sciences is furthering the understanding of key pharmacokinetic issues that affect the clinical interpretation of blood lead data and the impact of lead exposure pathways in pregnant women and children.

Previously collected but unpublished data from a large mammal model have the potential to provide important information on lead pharmacokinetics. These data are being evaluated for usefulness in understanding lead pharmacokinetics following short-term, high-level exposure of children, the bioavailability of lead from paint chips (as characterized by the National Institute of Standards and Technology) and the differential absorption of lead in pregnant versus non-pregnant females, to help inform a possible model for pregnant women. Thus, the document will support continuing education and is expected to serve as a reference to experts and the public. This effort will improve clinical interpretation of blood lead data by physicians and other healthcare workers as well as the general public. The information will also be useful to efforts that focus on protection of expectant mothers and for better understanding hazard assessment for lead-based paints.

Information regarding the previous use of a large mammal model for lead risk assessment can be found at: http://www.ncbi.nlm.nih.gov/pubmed/16882520.

Website for more information:
https://www.niehs.nih.gov/about/od/advisor/weis/

7.38 Department of Health & Human Services – National Institutes of Health/ National Institute of Environmental Health Sciences: Disaster Research Response Program

The NIH Disaster Research Response (DR2) Program provides support and resources for the federal response to that threaten public health from a range of environmental threats including lead exposure. DR2 is providing this support for the federal response to the lead in drinking water situation in Flint, Michigan. The DR2 website provides vital tools and information to support both the public health response effort and the needs of disaster researchers to examine environmental health threats as well as disaster vulnerability.

The DR2 Program is the national framework for research on the medical and public health aspects of disasters and public health emergencies. The DR2 website, provided by the National Institute of Environmental Health Sciences (NIEHS) and the National Library of Medicine (NLM), supports disaster-science investigators by offering numerous features, including data-collection tools, research protocols, and disaster-research news and events. Within the website, the NLM and NIEHS created a database of surveys, tools and resources that have been used in past disasters. This helps researchers who want to conduct disaster research find information quickly. Further, the website provides information on training and exercises, protocols for disaster research, networks, collaborations and a small database of tools and resources to assist disaster researchers. Information on the pre-reviewed NIEHS Rapid Acquisition of Post Incident Disaster Data Protocol is available on the website as well.

DR2 is working closely with the NIH Public Health Emergency Research Review Board and is also looking to address institutional review board processes related to disaster research and in particular disaster vulnerability as a factor in research.

Websites for more information:
https://disasterinfo.nlm.nih.gov/enviro/FlintLeadWater.pdf
https://dr2.nlm.nih.gov

7.39 Department of Health & Human Services – National Institutes of Health/ National Institute of Environmental Health Sciences: Environmental Influences on Child Health Outcomes including the Children's Health Exposure Analysis Resource

The Children's Health Exposure Analysis Resource (CHEAR) program helps improve understanding of how a wide range of environmental exposures, including how lead affects early life development, ultimately leading to interventions to protect children's health. CHEAR provides a laboratory support infrastructure that facilitates the inclusion of environmental exposures in children's health research. It does this in conjunction with the Environmental Influences on Child Health Outcomes (ECHO) program and the broader extramural children's health research community.

ECHO is a new trans-NIH program that will study the short and long term impacts of environmental exposures on children's health by using existing study populations, or cohorts, that include children. CHEAR is intended to expand the number of such studies that include environmental exposure analysis from conception through development, including chemical, physical and biological stressors as well as lifestyle, behavioral, natural, built and social environments. By assessing the totality of environmental exposures, ECHO endeavors to shed light on how these factors impact obesity, upper and lower respiratory disease, birth outcomes (prenatal, perinatal, and postnatal) and neurodevelopment.

CHEAR will support ECHO by providing laboratory analysis of environmental exposures for the cohort of approximately 50,000 children. CHEAR also intends to implement the exposome concept in children's health studies, create a public resource of children's exposures across the country and develop data and metadata standards for the environmental health sciences community.

Websites for more information:
https://www.niehs.nih.gov/research/programs/environmental/index.cfm
https://www.niehs.nih.gov/research/supported/exposure/chear/index.cfm

7.40 Department of Health & Human Services – National Institutes of Health/National Institute of Environmental Health Sciences: Extramural Research Portfolio on Health Impacts of Exposure to Lead

The National Institute of Environmental Health Sciences (NIEHS) helps increase understanding of lead effects by supporting an extramural grant portfolio of science research that focuses on the effects of lead on neurodevelopment and other health outcomes relevant to children. The funded projects provide a research basis for public health decision-making on lead exposure, biomonitoring, health effects, and risk communication.

Website for more information:
NIEHS Neurodevelopmental Grants:
https://tools.niehs.nih.gov/portfolio/index.cfm/portfolio/scienceCodeGrants/scode/61/topic/61

7.41 Department of Health & Human Services – National Institutes of Health/ National Institute of Environmental Health Sciences: Lead Exposure and Health Outcome and Communications

One of the ways in which NIEHS helps prevent childhood lead exposure is through its ongoing outreach and communication program. This program distributes information on lead exposure (and how to avoid it), health effects of lead and education about sources of lead, as well as information on other environmental health topics.

This outreach and communication effort is part of the NIEHS Strategic Plan, and it includes components for scientists, the public, and children. A lead webpage located at the Health and Education section of the NIEHS website includes information on the health effects of lead, exposure measurements, who is at risk, NIEHS lead-related funding announcements and other resources.

Other materials target children with lead-themed resources, as found on the NIEHS KidsPages online. These include:

- How Mother Bear Taught the Children about Lead
- The Lead Busters Club
- What is Lead
- Know Where Lead Might Be Hiding

The lead outreach effort extends to the NIEHS-funded Community Outreach and Engagement Core (COEC) at the University of Rochester's Environmental Health Science Center's Rochester Healthy Homes Partnership. This effort has included educational outreach activities that promote lead removal and healthy homes through systems change approaches.

Websites for more information:
https://www.niehs.nih.gov/health/topics/agents/lead/index.cfm
https://www.niehs.nih.gov/research/supported/translational/peph/grantee-highlights/2015/index.cfm#a748282
NIEHS KidsPages at http://kids.niehs.nih.gov including:
http://kids.niehs.nih.gov/activities/stories/mother-bear/index.htm
http://kids.niehs.nih.gov/activities/stories/lead-busters-club/index.htm
http://kids.niehs.nih.gov/topics/pollution/lead/index.htm
http://kids.niehs.nih.gov/topics/pollution/lead-house/index.htm

7.42 Department of Health & Human Services – National Institutes of Health/ National Institute of Environmental Health Sciences: National Toxicology Program Monograph on Health Effects of Low-Level Lead

The National Toxicology Program *Monograph on Health Effects of Low-Level Lead* helps experts and the general public understand the public health significance of low level lead exposures by summarizing the evidence for effects at blood lead levels <10 µg/dL and in some cases <5 µg/dL. In this manner, it serves as an ongoing

resource and reference document that supports continuing education. The evidence summarized in the monograph provides support for adverse health effects in both children and adults at blood lead levels below 10 µg/dL, and, for some effects, below 5 µg/dL.

Website for more information:
https://tools.niehs.nih.gov/wetp/

7.43 Department of Health & Human Services – National Institutes of Health/ National Institute of Environmental Health Sciences: Worker Training Program

The Worker Training Program (WTP) helps prevent lead exposure by providing high-quality occupational safety and health training to workers involved in handling hazardous materials or in responding to emergency releases of hazardous materials. The WTP offers specific courses on lead awareness, lead abatement and persistent bioaccumulative toxics.

The WTP is supported by Superfund and Department of Energy funding to provide cooperative agreements to 18 consortia comprising nonprofit organizations and their partners. The cooperative agreements support curricula development and training programs for workers who contact hazardous materials throughout the United States and its territories. Data from the five-year grant cycle (2005–2010) show that the program provided 204 lead-focused classes to 3,028 students (25,758 contact hours). During the current grant reporting period it is expected that grantees will conduct 19 lead-related courses for 394 students. Lead abatement and awareness courses will continue to be part of grantee applications in addition to those unplanned incidents where workers and their communities may benefit from such training.

The WTP can be adapted relatively swiftly to respond to a variety of disasters, both natural and man-made. For example, in response to the concerns in Flint, Michigan, a number of grantees supported by WTP cooperative agreements have expanded their activities to help the local community provide lead awareness training. In addition, grantees are helping unemployed residents find employment in lead-related work as part of the effort to build workforce capacity in this area. WTP's support of curriculum development and training programs help employers across the country meet requirements under the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard and EPA standards for hazardous waste operations and emergency response.

WTP curricula and trainings reduce illness and injury from work that involves hazardous materials such as lead, building workforce capacity with the appropriate certifications and training to perform this type of work safely. The trainings also empower workers with knowledge to recognize and address workplace hazards, reducing exposures that may contribute to acute and chronic illness. Community resilience is enhanced and exposures in the community are decreased as workers apply their knowledge regarding work safe practices within the community. The long-term impact of this training is to enhance the ability of local organizations to recruit and train workers who can address the hazards associated with lead-related work in environmental and construction occupations and who may be involved in remediation and recovery phases related to environmental contamination.

The NIEHS WTP will continue to provide lead-specific courses as well as courses that address additional hazards associated with remediation activities as described in OSHA's Hazardous Operations and Emergency Response Standard. The WTP encourages innovation in training difficult-to-reach populations by applying appropriate adult education techniques and addressing literacy issues while striving to improve the quality of trainings. The program enhances, rather than replaces, private-sector training by demonstrating new and cost-effective training techniques and materials.

Websites for more information:
General information about the Worker Training Program can be found at: https://www.niehs.nih.gov/careers/hazmat/index.cfm
The program supports the National Clearinghouse for Worker Safety and Health Training and can be found at: https://tools.niehs.nih.gov/wetp/

7.44 Department of Health & Human Services – National Institutes of Health/ National Library of Medicine: Enviro-Health Links – Lead and Human Health

The NLM helps to educate the public about the impacts of lead on human health through its Lead and Human Health webpage. This is a comprehensive and organized list of information resources designed to help users learn about lead's health effects by providing various types of data and links. The webpage connects the user to information about specific aspects such as lead and children, occupational exposure, lead in drinking water, how to test for lead and policies about lead. The webpage also makes it easy to retrieve relevant articles from PubMed and Toxline as well as records from other NLM databases, including consumer-health information in MedlinePlus. The webpage also links to information in Spanish.

The Lead and Human Health webpage is part of the NLM's collection of Enviro-Health Links that organizes and disseminates information to ensure that those who need the information can find what they need. The NLM has created this type of guide for several topics that are of significance to various segments of the population. The Lead and Human Health webpage receives an average of 633 page views per month.

Website for more information:
https://www.sis.nlm.nih.gov/enviro/lead.html

7.45 Department of Health & Human Services – National Institutes of Health/ National Library of Medicine: Hazardous Substances Data Bank Lead Overview and Chemical Records

The Hazardous Substances Data Bank (HSDB) helps health professionals and the general public understand the effects of lead as part of its database of toxicology, environmental fate and exposure data on potentially hazardous chemicals. The HSDB contains records on elemental lead and lead compounds (general and specific). As described below, a recent update to the database format provides more accessible information on lead and other chemicals that is written in non-technical language for the public.

Initially, HSDB chemical records contained mainly technical information from published literature. However, in response to a recent surge in news coverage, user comments, focus groups and a needs assessment, a feature called the Overview was added to HSDB records about lead and other chemicals. As developed by the Specialized Information Services, a division of the National Library of Medicine, the Overview summarizes the identification; use; exposure and risk of health effects of lead, including children and infants; and evidence and classification as a carcinogen. The Overview also contains a For More Information section that provides links to various government resources on lead in one place.

The major, short-term accomplishment of this work is that HSDB now better addresses the needs of non-technical users within the general public. The intermediate and long-term accomplishment is that NLM/SIS can expand user impact for HSDB, which already averages about 250,000 queries per month. The brief, simple Overview summary not only addresses general-public needs, but also provides the key information for lead to professionals who would like to start with more general information before moving to the extensive record profile, which includes excerpts from

the technical literature (journal articles, books, monographs, etc.). Also, users now have the ability to quickly link to additional information from many authoritative government sources in one place.

Websites for more information:
Main site: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
Lead records with Overview at top of Table of Contents:
https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@DOCNO+231 (elemental)
https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@DOCNO+6923 (compounds)

7.46 Department of Health & Human Services – National Institutes of Health/ National Library of Medicine: Outreach to Students, Teachers and Consumers

The National Library of Medicine (NLM) helps educate the public regarding lead hazards by providing two websites designed to teach students and teachers about lead in the environment and its health effects. This form of information outreach provides summary information written in simple, easy to understand language and includes organized external links that address lead health hazards in the environment.

The two websites are the Environmental Health Student Portal, which targets middle-school students and teachers, and Tox Town, which targets students in grades 7 through 12 as well as general consumers.

The Environmental Health Student Portal also includes an NLM-designed animation that explains lead's chemical properties, presence in the environment and consumer products, health effects and mitigation to middle school students. The animation uses engaging imagery featuring a misguided lead-suit-clad superhero, Leadman, and is aligned with the introductory chemistry curriculum.

The average number of unique visitors to Environmental Health Student Portal and Tox Town are 8,159 and 28,783 per month, respectively. The NLM regularly receives positive feedback about the sites and animation from participants in conferences comprising educators, public health specialists, information specialists and school nurses (e.g., National Science Teacher Association, National Association of School Nurses).

Websites for more information:
Environmental Health Student Portal: https://kidsenvirohealth.nlm.nih.gov/
Tox Town: https://toxtown.nlm.nih.gov/

7.47 Department of Health & Human Services – National Institutes of Health/ National Library of Medicine: Online Databases in Toxicology and Environmental Health and Medicine

The National Library of Medicine (NLM) helps the public gain access to key hazard and risk information about lead through its TOXNET suite of databases in toxicology and environmental health. These resources contain a wide variety of information about lead that is of use to research scientists, public health workers, clinicians, emergency responders and the public.

Databases with information about lead include Toxline, which includes citations to the journal literature; TOX MAP, which maps the locations of chemical releases across the country and uses the EPA's Toxics Release report; Hazmap, which specifically links chemical exposure to occupations and potential occupational diseases; ChemIDplus, which is a chemical dictionary; and WISER, which is the Wireless Information System for Emergency Responders. WISER contains information about lead intended to assist emergency responders in the event of a spill or other emergency incident involving lead and lead compounds.

In addition to the suite of toxicology databases, the NLM's PubMed/MEDLINE database contains citations to research articles about lead, lead poisoning, therapy for lead poisoning, epidemiology, diagnosis and other specific topics. The NLM's heavily used MedlinePlus consumer health-information resource (in English and Spanish) includes information on Lead Poisoning written for the general public. About 8,000 people access MedlinePlus for this consumer-level information on lead poisoning each month.

MedlinePlus is the National Institutes of Health's website for patients and their families and friends. Produced by the NLM, the world's largest medical library, it provides information about diseases, conditions and wellness issues in readily understood language. MedlinePlus offers reliable, up-to-date health information, anytime and anywhere, for free.

PubMed is a free resource developed and maintained by the National Center for Biotechnology Information at the NLM. Pubmed provides free access to MEDLINE, the NLM's database of citations and abstracts in the fields of medicine, nursing, dentistry, veterinary medicine, health care systems and preclinical sciences.

ClinicalTrials.gov is a registry and results database of publicly and privately supported clinical studies of human participants conducted around the world. Learn more about clinical studies and about this site, including relevant history, policies and laws.

In 2015, the average number of unique TOXNET users was 288,905 per month and the average number of searches was 500,724 per month. Although these are on all topics, not just lead, it is clear that TOXNET has a wide reach and is used throughout the world for toxicological, chemical and environmental health information. The NLM collects, organizes and disseminates these resources to ensure that those who need the information have access and can find what they need. The NLM periodically conducts various studies including focus testing and customer satisfaction surveys and redesigns the system in response to what is learned.

Websites for more information:
https://www.ncbi.nlm.nih.gov/pubmed/
https://medlineplus.gov/aboutmedlineplus.html
https://clinicaltrials.gov/

7.48 Department of Health & Human Services – Office of the Assistant Secretary for Health/Region IV: Lead-based Paint Pilot Program

The EPA Region 4 office has partnered with the Office of the Assistant Secretary for Health (OASH) Region 4 and Shelby County, Tennessee, to help prevent childhood lead exposure through a pilot project to increase adherence to the EPA's Lead Renovation, Repair and Painting (RRP) Rule. The pilot project will reinvigorate efforts to ensure lead-safe practices in projects that disturb lead-based paint and will start the discussion on better permitting practices throughout the Region. The pilot project launched in November 2015 and will end in May 2017.

Shelby County's children are a population at high risk for lead exposure. The county has 80,664 children under age 6 years, 29,309 of whom are in poverty, and has 52,641 homes built before 1950. The RRP Rule requires that firms performing renovation, repair and painting projects that disturb lead-based paint in homes, childcare facilities

and pre-schools built before 1978 have their firm certified by the EPA (or an EPA-authorized state), use certified renovators who are trained by EPA-approved training providers and follow lead-safe work practices.

OASH Region 4 is providing the EPA Region 4 office with technical assistance and support, which includes obtaining lead exposure rates from the CDC, intensive outreach efforts and connecting the EPA with partners who have the potential to reach parents, caregivers, health professionals and others. The OASH Region 4 office is also an active participant in stakeholder meetings and other activities to encourage community involvement.

The effort aims to increase awareness of the dangers of lead and the importance of testing in Memphis, Tennessee. It is anticipated that Shelby County, Tennessee, will serve as a model for other counties in Region 4.

Website for more information:
https://www.epa.gov/newsreleases/epa-and-city-memphis-and-shelby-county-partner-address-lead-homes

7.49 Department of Health & Human Services – Office of the Assistant Secretary for Health/Office of Disease Prevention and Health Promotion: Healthy People 2020

The HealthyPeople.gov website and related programs help prevent childhood lead exposure through prevention resources it provides online as well as via Healthy People 2020, which tracks two key objectives that relate to children's blood lead levels. Information on lead poisoning prevention is also available in an easy-to-use format for the general public at the related website, Healthfinder.gov.

HealthyPeople.gov is a health-promotion and disease-prevention resource for public health professionals to plan programs and develop policies. HealthFinder.gov is a prevention and wellness resource for consumers and their families. Both websites contain evidence-based resources and are for informational purposes.

Healthy People 2020 tracks two objectives within the Environmental Health (EH) topic area that relate to lead exposure in children. These are EH - 8.1: Reduce blood lead level in children aged 1–5 years, and EH 8.2: Reduce the mean blood lead levels in children. This topic area is co-led by representatives from the National Institute of Environmental Health Sciences at the NIH and from the National Center for Environmental Health at the CDC. Workgroup representation also comes from the EPA, HUD and the National Center for Health Statistics (NCHS, CDC). The National Health and Nutrition Examination Survey from NCHS/CDC is the data source for these children's blood lead objectives.

HealthFinder.gov provides evidence-based actionable prevention and wellness information for consumers and their families. Healthfinder.gov contains a Lead Poisoning Prevention page that provides an overview on lead poisoning including summaries on the causes and safety tips. Additional resources are provided with respect to testing homes for lead and screening children for exposure.

Websites for more information:
https://www.healthypeople.gov/2020/topics-objectives/topic/environmental-health/objectives
https://healthfinder.gov/HealthTopics/Category/pregnancy/getting-ready-for-your-baby/protect-your-family-from-lead-poisoning

7.50 Department of Health & Human Services – Office of the Secretary/Office of Global Affairs: Role of the Health Sector in the Management of Chemicals

The Office of Global Affairs (OGA) is promoting the sound management of chemicals, including lead, throughout the world by the year 2020. Worldwide, 1.3 million lives are lost every year due to exposures to selected chemicals, such as lead. OGA was instrumental in the development of a World Health Assembly resolution on the health sector's role in the sound management of chemicals.

Country commitments to the resolution will promote the use and production of chemicals in ways that minimize significant adverse effects on human health and the environment by 2020, a critical target of the 2030 Agenda for Sustainable Development. The resolution was adopted by 194 countries, including the United States, at the 69th World Health Assembly (May 23–28, 2016).

Websites for more information:
http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_19-en.pdf
www.who.int/ipcs/en

7.51 Department of Health & Human Services – Substance Abuse and Mental Health Services Administration: Addressing Behavioral Health Impacts of Adverse Environmental Exposures

The Substance Abuse and Mental Health Services Administration (SAMHSA) is helping address the impacts of lead exposure in children and families through programs that support the behavioral health needs of a community related to environmental health risk exposures.

The SAMHSA recognizes the behavioral health impact that certain environmental exposures can have on young children and the need to meet the emotional and behavioral needs of these children. Certain SAMHSA-grant programs are designed to create a more collaborative and coordinated children's system and thus help children with a wide range of behavioral health issues including those related to environmental exposures.

In addition, the SAMHSA's Disaster Distress Helpline is a national hotline that provides immediate crisis counseling and support to people experiencing emotional distress related to natural or human-caused disasters. Stress, anxiety and other depression-like symptoms are common reactions after a disaster. This toll-free, multilingual and confidential crisis support service is available to all residents in the United States and its territories year-round and can be accessed at 1-800-985-5990 or text TalkWithUs to 66746.

A free smartphone application created by the SAMHSA makes it easier for behavioral health responders to focus on disaster survivors by providing them quick access to resources for getting help. The SAMHSA Disaster App was designed to meet the needs of disaster responders.

Websites for more information:
www.samhsa.gov/grants/grant-announcements-2016
www.samhsa.gov/find-help/disaster-distress-helpline
https://store.samhsa.gov/apps/disaster/

7.52 Department of Housing and Urban Development – Office of Lead Hazard Control and Healthy Homes: Enforcement and Technical Support for the Lead Disclosure Rule and the Lead Safe Housing Rule

The Department of Housing and Urban Development's (HUD) program offices have reduced the prevalence of lead-based paint hazards and lead exposure among children living in target housing by contributing to the enforcement of the Lead Disclosure Rule, by implementing the Lead-Safe Housing Rule (LSHR) and by funding the EPA's National Lead Information Center. The impact of these efforts and coordination with other agencies is described below.

The LSHR (24 CFR 35, subparts B – R) covers lead evaluations and lead-hazard reduction in HUD programs that provide housing assistance to low-income families. HUD's program offices implement the LSHR, and HUD has proposed an amendment to track CDC's approach of identifying elevated blood lead levels in children for which environmental interventions are appropriate, for use in HUD-assisted housing. HUD actions to improve compliance and update the rule will provide further protection to children.

HUD continues to work with the EPA and the Department of Justice in enforcing the Lead Disclosure Rule (24 CFR 35, part A, and 40 CFR 745, subpart F). In settling disclosure cases, landlords have committed to expend more than $31 million to address lead-based paint hazards in target housing. HUD's lead-disclosure settlements have resulted in defendants reducing lead hazards in more than 186,745 apartments, paying $1,466,399 in civil penalties and providing $703,750 to community-based projects to reduce lead poisoning, as of mid-2016.

HUD continues to provide co-funding to the EPA to support operation of the National Lead Information Center, which provides the public and professionals with information about lead hazards and methods for the prevention and control of these hazards.

Website for more information:
https://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes

7.53 Department of Housing and Urban Development – Office of Lead Hazard Control and Healthy Homes: Lead-Based Paint Hazard Control and Lead Hazard Reduction Demonstration Grant Programs

These HUD programs help decrease childhood lead exposure by providing grants to state and local governments to identify and mitigate lead-based paint hazards in low-income housing. The grants are awarded through an annual competitive Notice of Funding Availability and are targeted toward housing that is privately-owned (owner-occupied or rental) where income-eligible occupants reside with children. The focus of the programs is creating lead-safe units for low-income households.

More than 173,000 housing units have been made lead-safe for residents through the Office of Lead Hazard Control and Healthy Homes's grant programs since 1993. The programs have also been important for the development and maintenance of a national infrastructure of lead hazard control professionals (i.e., lead risk assessors, qualified contractors), and they have supported public education/outreach activities by grantees throughout the United States The programs have contributed to the steady decline in children's blood lead levels that has been documented in the United States.

The number of housing units with one or more significant lead-based paint hazards is estimated to be 23.2 million, according to the most recent national survey,[4] completed in 2006. These grant programs are an ongoing effort, with an expected production rate of approximately 7,500 lead-safe units per year, given current funding levels. In fiscal year 2016, HUD awarded 38 grants totaling $88 million in lead-hazard control funds.

Per statutory requirements, Lead-Based Paint Hazard Control funding cannot be used to identify and/or address lead hazards in drinking water or other non lead-based paint hazard sources of lead exposure. As such, the scope of these programs is limited to identification and remediation of lead hazards related to lead-based paint, dust and soil.

This grant program works closely with federal, state and local lead poisoning surveillance partners to encourage the enrollment of eligible units that house children with elevated blood lead levels (i.e., ≥ 5 µg/dL as per the CDC reference level as of mid-2016), as well as children with lower blood lead levels.

Website for more information:
https://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/lbp/lhc

7.54 Department of Housing and Urban Development – Office of the Secretary: Lead-Safe Homes, Lead Free Kids Toolkit

To prevent lead exposure and strengthen protections for families in HUD-assisted housing, in June 2016, HUD announced and began implementing its Lead-Safe Homes, Lead-Free Kids Toolkit, which provides its vision for immediately changing its programs and seeking legislative proposals to obtain needed authority to ensure all HUD-assisted housing is lead-safe. Building on its current lead safety programs, the toolkit establishes specific goals for the Department.

These include strengthening HUD's regulatory framework by proposing revisions to its Lead Safe Housing Rule to align its level of children's blood lead requiring immediate environmental intervention with the CDC's reference level. HUD will also increase monitoring of its housing-assistance programs to ensure that assisted landlords, whether public housing agencies or private owners, identify and then address lead-based paint hazards, enhance Lead Safe Housing Rule and Lead Disclosure Rule enforcement and clarify its guidance about these rules. HUD will work with its Administration partners to develop consistent criteria for acceptable water quality in HUD-assisted housing and a consistent response to exceedances of that standard.

HUD will provide education and targeted outreach to increase lead awareness by HUD families, housing providers, local governments and other key stakeholders, and will work with health departments to make available blood lead level testing to all children under age 6 years in HUD-assisted homes.

HUD will further its lead research program to identify best practices for lead safety in housing and determine where best to target federal resources. For example, it will study how well its grantees use formula grants to address lead safety, survey the prevalence of lead-based paint hazards in housing, determine how better to identify and control lead hazards and assess how to efficiently strengthen lead safety monitoring of HUD-assisted housing.

Website for more information:
https://portal.hud.gov/hudportal/documents/huddoc?id=HUDLeadToolkitFACTSHEET.pdf

7.55 Department of Housing and Urban Development – Office of Lead Hazard Control and Healthy Homes: Support for Research to Improve Methods to Identify and Control of Residential Lead-Based Paint Hazards and Track Lead Hazards in U.S. Housing

Since FY 1997, HUD has competitively awarded cooperative agreements to support research to improve the efficacy and cost-effectiveness of methods for the evaluation and control of residential lead-based paint hazards through its Lead Technical Studies grant program. This program responds to a statutory requirement for HUD to conduct lead research on such topics as developing improved methods for evaluating and reducing lead-based paint hazards in housing. The availability of this program varies depending on annual appropriations.

Recently completed research, published in peer-reviewed scientific journals, demonstrated that complete window replacement is associated with reduced dust-lead loadings on floors and highlighted the risk of attached porches as potential sources of lead exposure. Active program-supported research includes developing improved chemical spot-test kits to identify lead-based paint and nonlead-based paint, and evaluating approaches to improve the effectiveness of residential lead regulations in Rhode Island.

HUD conducts lead-related research through contracts and also supports research by federal partners through interagency agreements. HUD has documented the prevalence and distribution of lead-based paint hazards in U.S. housing in two national surveys – most recently in 2006 – and is in the initial stages of planning another national survey to assess progress in reducing residential lead hazards in U.S. housing.

Website for more information:
https://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes

7.56 U.S. Department of Agriculture – National Institute of Food and Agriculture – Michigan State University Extension

The National Institute of Food and Agriculture (NIFA) is helping address the issue of lead exposure in children by the leadership it provides in promoting adequate nutrition in children. A nutritious diet high in iron, calcium and vitamin C helps reduce lead absorption in a child. An example of a NIFA-funded program helping the community in this manner is the recent work of Michigan State University (MSU) Extension in Flint, Michigan, as described below.

NIFA provides program leadership and funding to support the work of the institutions of higher learning that make up the Land-Grant University and Cooperative Extension System. As the 2015 water crisis in Flint unfolded, the MSU Extension didn't have to rush to aid Flint because it was already there as a part of the community for more than 100 years. Through this relationship, the MSU Extension had the ability to respond rapidly to the needs of residents. Initiatives implemented by MSU resulted in an increased use of lead-mitigating behaviors by Flint residents.

MSU Extension staff in Flint adjusted standard nutrition education messaging to reflect the important role of a nutritious diet and avoiding deficiencies in iron, calcium and vitamin C in helping reduce lead absorption in the body. More than 10,000 Fight Lead with Nutrition booklets were distributed via classes, workshops and through local partners. In addition, the MSU Extension supported the Michigan Milk Producers Association and Kroger Co. in the effort to donate and ship 12,000 gallons of milk to the city of Flint.

The MSU Extension's Fight Lead Exposure website acts as hub for current and upcoming resources, events and articles produced by the MSU Extension. The MSU Extension also created the Empower Flint smartphone application, which provides mobile access to resources related to water, food, health and pets.

7.57 Department of Housing and Urban Development and U.S. Department of Agriculture: Healthy Homes Initiative Partnership

The U.S. Department of Agriculture, through the National Institute of Food and Agriculture, collaborates with HUD on the Healthy Homes Initiative (HHI) to support research, education and extension programs that increase home health and safety, improve family health and build stronger communities. Since 1999, HHI has addressed multiple housing related problems, including lead hazards, that affect the health of children and families. This cooperation resulted in funding to Auburn University for the Healthy Homes Partnership involving numerous states delivering educational programs through the Land-Grant University System. Additionally, HUD and USDA recently released two a joint publications in August 2016 titled "Everyone Deserves a Safe and Healthy Home," one for consumers, and one for stakeholders; both publications cover lead hazards. These efforts have mobilized individual actions and improved environmental decision-making skills among millions of consumers.

Websites for more information:
http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/hhi
https://nifa.usda.gov/healthy-homes-initiative

7.58 U.S. Department of Agriculture – Food and Nutrition Service: Food and Nutrition Service: Using Nutrition as a Tool to Reduce Lead Absorption

Lead exposure – via water, soil, or another medium – is a public health problem affecting people across our nation. Exposure to unsafe levels of lead can cause serious health effects, especially among children. Immediate and widespread action is critical. The nutrition assistance programs administered by USDA's Food and Nutrition Service (FNS) may help lessen the negative impacts of lead exposure by using nutrition as a tool to reduce lead absorption.

FNS has included fact sheets on their website that provides tips for state and local governments, agencies and community leaders on how FNS programs can be leveraged in the event of a lead crisis in two major ways:
1) Promoting balanced diets featuring key nutrients; and 2) Helping ensure access to safe drinking water.

Website for more information:
http://www.fns.usda.gov/federal-nutrition-programs-reducing-impact-lead-exposure

SECTION 8:
Members of Lead Working Group

The Co-Chairs of the Senior Staff Steering Committee of the President's Task Force on Environmental Health Risks and Safety Risks to Children, Dr. Ruth Etzel (EPA) and Ms. Sandra Howard (HHS), thank all of the contributors to this report, especially the members of the Lead Working Group:

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President's Task Force on Environmental Health Risks and Safety Risks to Children

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