LEAD POISONING PREVENTION:
A GUIDE FOR LEGISLATORS

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in cooperation with the
U.S. Environmental Protection Agency

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Lead Poisoning Prevention: A Guide for Legislators presents a comprehensive overview of the issues and policies surrounding lead poisoning prevention and lead hazard reduction. Data for this publication came from documents and reports prepared by the U.S. Department of Health and Human Services, the U.S. Department of Housing and Urban Development, and the U.S. Environmental Protection Agency; from research into state and federal statutes and regulations; from information collected from contacts in state governments; and from legislative staff.

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EXECUTIVE SUMMARY

Lead poisoning is considered the foremost environmental threat facing children today. According to the U.S. Centers for Disease Control and Prevention, 1.7 million children in this country have levels of lead in their blood exceeding the amount recognized as safe by the federal government. Children from every geographic region, race, and socioeconomic level have been found with elevated blood lead levels, making lead poisoning the most pervasive childhood environmental disease in the U.S. today. It is also completely preventable.

In the past states and the federal government adopted strict regulations to control or limit exposure to lead, which significantly reduced the overall levels of lead in humans. However, studies tracking blood lead levels in children over an extended period proved that even minimal levels can cause severe irreversible health effects. These studies prompted the federal Centers for Disease Control and Prevention (CDC) to further lower the level of concern for lead in the blood from 25 µg/dL to 10 µg/dL, thereby greatly expanding the number of children with blood lead levels warranting concern.

This publication surveys the issue of lead poisoning and presents methods used by states and the federal government to reduce and prevent lead poisoning. The guide is divided into five sections:

- The nature and extent of lead poisoning
- State role in reducing lead hazards
- The training, certification and accreditation of lead inspection, risk assessment, and abatement professionals
- Sources and approaches to funding state programs
- Appendixes of federal and state lead poisoning prevention laws, a bibliography and reference section

Each section highlights innovative approaches undertaken by states or presents common problems states face regarding lead poisoning. Chapters 3 and 4 emphasize two issues most pressing to states in the near future because of recently enacted federal laws and regulations. The appendixes provide a comprehensive reference to state and federal laws. Also included is a bibliography of relevant publications and a reference guide for further information.

The Nature and Extent of Lead Poisoning

Almost 9 percent of children in this country are believed to have elevated blood lead levels. Fifty-seven million homes have lead-based paint, posing a risk to as many as 9.9 million children. Thirty percent of elevated blood lead levels in children can be attributed to lead in soils and dust, and 30 million people use drinking water systems containing lead in excess of federal standards.

Though the sources of lead have been identified and remedies acknowledged, children continue to be poisoned because of the enormity of the problem. Lead, as an element and a highly toxic metal, exists throughout the United States. Almost five million tons of lead were used in residential paint; 7.3 million tons were used for leaded gas. Massive amounts of lead were also used in plumbing and numerous other consumer and industrial goods. Although its current uses and production have been greatly reduced, lead remains a threat because it persists indefinitely in the environment.

When absorbed by humans, lead disturbs virtually every bodily system, most severely the brain and central nervous system. Extreme lead poisoning causes convulsions,
mental retardation, seizures, and sometimes death; low levels of poisoning reduce intelligence, delay cognitive growth, and impair physical development. In children, infants, and fetuses, lead is particularly harmful because it damages the developing brain and central nervous system permanently.5

State Role in Reducing Lead Hazards

Although the federal government looks to the states to implement policies to reduce lead hazards and 24 states have enacted laws regarding some aspect of lead poisoning prevention, few have enacted comprehensive lead hazard reduction programs (see table 1 for a summary of state lead hazard reduction programs). In 1992, Congress passed the Residential Lead-Based Paint Hazard Reduction Act, also known as Title X, which depends upon states adopting training and certification programs for risk assessment, inspection, and abatement professionals and builds an infrastructure that states can use to control the hazards that cause lead poisoning.

Comprehensive state programs encompass both primary and secondary prevention. Secondary prevention identifies lead-poisoned children and then removes or controls the lead hazard causing the poisoning. Primary prevention identifies and remediates the sources of lead exposure before a child is harmed.6 States enacting comprehensive programs have seen significant reductions in cases of elevated blood lead levels. In other states, screening data has not identified many lead-poisoned children.

Surveillance helps states assess the sources of lead in communities, determine exposure patterns, and identify high-risk populations. Screening children provides the most accurate determination of the extent of elevated blood lead levels, though few states require universal screening.7 Thirty-eight states use reporting of lead poisoning to determine the number of children with lead poisoning.8 Public outreach programs to educate the public about lead poisoning prevention are conducted in 38 states.8 Medical case management provides parents with educational materials and coordinates with other support services to ensure that the child receives proper attention through the lengthy recovery period. Environmental case management, or follow-up, allows for the discovery and remediation of the sources of a child’s exposure. Inspection and risk assessments identify lead hazards and make recommendations for remediation, and abatement programs reduce the hazards found. Certification of inspection and abatement professionals is required in 20 states and soon will be required nationwide under Title X. Title X also requires disclosure of known lead-based paint hazards upon the sale or lease of housing built before 1978.

State policies and programs in two areas are of special importance at this stage of the nation’s response to lead poisoning: the training, certification, and accreditation of professionals in lead risk assessment, abatement, and inspection; and funding of state programs for lead poisoning prevention.

Training, Certification, and Accreditation

With 57 million homes having lead-based paint and 20 million needing remediation, training and certification of professionals to perform lead risk assessment, abatement, and inspection activities and the accreditation of training programs are crucial to ensure that remediation effectively reduces lead hazards. Incorrect inspections can identify hazards where there are none; improper abatements can increase, rather than diminish, exposure to lead in a home. Though many states are moving toward implementing training and certification programs, property owners, the real estate community, and other businesses involved with older housing are concerned
that these programs are burdensome and costly.

Twenty states in 1994 require training and certification of lead inspection, risk assessment, abatement professionals, and accreditation programs. The Lead-Based Paint Hazard Reduction Act of 1992 (Title X) directs the U.S. Environmental Protection Agency (EPA) to develop a national training, certification, and accreditation program that requires that training programs be accredited and professionals be certified before performing risk assessment, inspection, and abatement activities in housing built before 1978; in public or commercial buildings; or on steel structures. \(^\text{10}\) EPA is developing the program at the federal level with the intent that it will be adopted by states.

**Funding of State Programs**

Removal of lead-based paint is expected to cost $49.9 billion over the next 10 years, and the encapsulation of lead contaminated areas approximately $36.3 billion. \(^\text{11}\) CDC estimates that $974.3 million is needed to eliminate childhood lead poisoning from both public and private sources. Lack of adequate funds is the main obstacle to states implementing comprehensive lead poisoning prevention programs. States with lead poisoning prevention programs use some general appropriations, but the majority of support comes from fees, direct taxes, bonds, and federal grants and loans. CDC currently funds most state screening programs (though these funds are seen as start-up funds, rather than a continuing source of money), and the U.S. Department of Housing and Urban Development (HUD) has begun to provide grants for private residential abatement projects. Title X also authorizes HUD and EPA to provide grants to states to establish training, certification, and accreditation programs.

States usually place the financial burden of programs directly on the main beneficiaries or participants: direct fees on training providers and the accredited workforce, taxes on industries that historically have used lead, and fees on owners of dwelling units with lead-based paint. Such financing fluctuates with the number of participants and their ability to pay and cannot guarantee sufficient funding for a state's program.

**Federal Statutes**

The federal government regulates lead poisoning and lead hazard reduction through three main statutes and their implementing regulations: the Lead-Based Paint Poisoning Prevention Act; the Lead Contamination Control Act; and the Residential Lead-Based Paint Hazard Reduction Act (Title X). The recently passed Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X) directs the U.S. Environmental Protection Agency (EPA) to develop a national training, certification, and accreditation program that requires training programs be accredited and professionals be certified before performing risk assessment, inspection, and abatement activities in housing built before 1978; in public or commercial buildings; or on steel structures. In addition to primary prevention, Title X addresses training and certification of risk assessment, abatement, inspection professionals, and accreditation of training programs. It also provides funding for abatement; directs EPA to develop health-based standards for hazardous levels of lead in paint, dust and soils; directs HUD to inspect and abate certain government-owned and -financed housing; provides for public outreach programs; and directs EPA, HUD, and the Occupational Safety and Health Administration (OSHA) to promulgate implementing regulations.

**State Statutes**

Several states have programs addressing lead poisoning. **Massachusetts** has the most comprehensive long-standing program, and **Maryland’s** program has been in existence...
since 1974. **Arkansas, California, Connecticut, Georgia, Illinois, Louisiana, Maine, Minnesota, Missouri, New Hampshire, New Jersey, Ohio, Rhode Island, Virginia, Vermont, and Wisconsin** have passed legislation to implement comprehensive programs that should meet the standards of the recent federal mandates. **Arizona, Delaware, Iowa, Kentucky, New York, North Carolina, Oklahoma, and South Carolina** have statutes that in some manner address lead poisoning.
Table 1. Status of State Lead Hazard Reduction Programs

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</tr>
</tbody>
</table>
1. THE NATURE AND EXTENT OF LEAD POISONING

Lead is a highly toxic metal that exists in paints, dust, and soils in and around homes in the United States. If ingested by humans lead disturbs virtually every system in the body and provides no physiological benefit. The most comprehensive study of blood lead levels, the Third National Health and Nutrition Examination Survey (NHANES), estimates 1.7 million children have blood lead levels at least 10 µg/dL or above.¹²

**Characteristics of the Metal**

Lead has unique properties that increase the severity of the problem. As an element, inorganic lead cannot be processed or destroyed, nor can its chemical structure be changed. Lead also accumulates in the environment. Once released from its natural state it remains indefinitely, continually posing a threat for which there are no natural defenses.¹³

Before the industrial age, exposure to lead was rare. Industrialization, however, released massive amounts of lead into the environment. Lead was used extensively in paints and gasoline, emitted from smelters and factories, used in pipes and plumbing for water systems, as well as in other consumer and industrial applications. Large amounts of lead remain in old paint and drinking water.

---

**Figure 1**

**Lead Levels in Blood That Cause Certain Effects in Children**

<table>
<thead>
<tr>
<th>Effect</th>
<th>µg/ dL</th>
<th>Medical Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>150</td>
<td>↑ Immediate medical and environmental interventions</td>
</tr>
<tr>
<td>Encephalopathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- adverse effects to the brain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and can cause coma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nephropathy</td>
<td>100</td>
<td>← Medical and environmental interventions</td>
</tr>
<tr>
<td>- harmful to kidneys and their functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anemia</td>
<td>70</td>
<td>← Medical evaluation and environmental intervention</td>
</tr>
<tr>
<td>- occurs in low blood cell count</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colic</td>
<td>50</td>
<td>↓ Nerve Conduction Velocity</td>
</tr>
<tr>
<td>Hemoglobin Synthesis</td>
<td>40</td>
<td>- nervous system adversely affected</td>
</tr>
<tr>
<td>- body's ability to produce hemoglobin is decreased</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin D Metabolism</td>
<td>30</td>
<td>↓ Erythrocyte Protoporphyrin</td>
</tr>
<tr>
<td>- body's ability to process vitamin D is affected</td>
<td></td>
<td>- indicates a body's inability to produce hemoglobin</td>
</tr>
<tr>
<td>Nerve Conduction Velocity</td>
<td>20</td>
<td>↑ Developmental Toxicity</td>
</tr>
<tr>
<td>- nervous system adversely affected</td>
<td></td>
<td>- Decreased IQ</td>
</tr>
<tr>
<td>Erythrocyte Protoporphyrin</td>
<td></td>
<td>- Hearing impaired</td>
</tr>
<tr>
<td>- indicates a body's inability to produce hemoglobin</td>
<td></td>
<td>- Growth affected</td>
</tr>
<tr>
<td>Developmental Toxicity</td>
<td>10</td>
<td>↓ Not considered lead poisoned</td>
</tr>
<tr>
<td>Decreased IQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearing impaired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth affected</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: The levels in this diagram do not necessarily indicate the lowest levels at which lead can have an effect. These are the levels at which studies have adequately demonstrated an effect.

systems. Dust and soil contain the residues from all these major sources, and natural forces widely disperse dust contaminated by lead. No socioeconomic group, geographic area, or racial or ethnic population is free from lead.

Effects on Children and Pregnant Women

When absorbed into the body, lead usually affects the central nervous system most severely (see figure 1). It is, therefore, particularly harmful even at low-levels to the developing brain and nervous system of young children, infants and fetuses. Children and infants are more likely than adults to be poisoned by lead because they have more hand-to-mouth activities and thereby ingest more lead-contaminated dusts and paints. Their bodies also are more likely to absorb the lead once ingested.

Lead affects pregnant women by causing premature deliveries and lower birthweight and, in extreme cases, causing miscarriages and stillbirth. Research has indicated that low levels of lead in the blood harm a fetus’ central nervous system, and the Centers for Disease Control and Prevention (CDC) believes it may have an adverse effect.

Lead poisoning is measured by blood lead content: the number of micrograms of lead in a deciliter of blood (µg/dL). A microgram per deciliter is equivalent to four grains of salt placed in a swimming pool. Extreme levels in children, above 80 µg/dL, can cause comas, convulsions, and death if not treated. Lower levels, between 25 µg/dL and 60 µg/dL, cause adverse effects on the central nervous system, the kidneys, and blood-forming organs. At levels nearing 10 µg/dL, lead decreases intelligence and impairs neurobehavioral development. Other effects linked to low blood lead levels include decreased height, impaired hearing, and an inability to stand upright.

Sources and Reduction of Exposure

The three major sources of lead are lead-based paint, lead particles in dust and soils (mostly contaminated by lead in paints and gasoline), and lead in drinking water. Lead from smelters and other stationary sources, municipal waste and sewage sludge incinerators, and consumer products also contribute to lead into the environment (see figure 2).

Lead-based paint. Lead in household paints is the most frequent cause of lead poisoning. Although the sale and use of lead-based paint was banned in 1978, 4.9 million tons of lead were used in paints, and more than 57 million homes have lead-based paint. Nearly 10 million of these homes are occupied by families with children under seven, and almost four million of these homes have chipping and peeling paint that poses an immediate risk to children. Many children from upper- and middle-income families are being exposed to lead paint and dust from home.
Figure 3
Number and Age of U.S. Homes

All Areas

North Central

West

Northeast

South

North Central: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

West: AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, WA, WY

Northeast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

South: AL, AK, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

Table 2
Number of Owner-Occupied Properties and Single-Family Rental Properties

<table>
<thead>
<tr>
<th></th>
<th>Owner-Occupied Properties</th>
<th>Single-Family Rental Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Households</td>
<td>Children under 6</td>
</tr>
<tr>
<td>Pre-1950</td>
<td>16,225,000</td>
<td>2,140,000</td>
</tr>
<tr>
<td>1950-1959</td>
<td>8,982,000</td>
<td>1,103,000</td>
</tr>
<tr>
<td>1960-1969</td>
<td>9,570,000</td>
<td>1,193,000</td>
</tr>
<tr>
<td>1970-1978</td>
<td>11,251,000</td>
<td>1,563,000</td>
</tr>
<tr>
<td>Post-1978</td>
<td>13,768,000</td>
<td>3,380,000</td>
</tr>
</tbody>
</table>

Source: American Housing Survey, 1991

renovation projects and lead-contaminated soil around homes, playgrounds, and schools (see table 2).

The older the home, the greater the amount of lead-based paint. Of the 4.9 million tons of white lead pigment used between 1910 and 1989, 92 percent was used prior to 1950, most of it between 1910 and 1939.24 The greatest concentration of older homes is in the Northeast and upper Midwest (see figure 3).

Children ingest lead paint mostly from getting lead particulates on their hands then into their mouths, though some do eat paint chips. These particulates come from deteriorated or damaged paint or from paint dust released during a renovation into carpeting, floors, and window sills.

Reduction and abatement of lead-based paint. To lessen exposures to lead-based paint requires either making the paint inaccessible or removing it completely. Encapsulation or enclosure of the paint prevents access and is an acceptable abatement method in Illinois, Kentucky, Louisiana, Massachusetts, Minnesota, and Wisconsin. Encapsulation involves covering paint with a material that bonds to the surface, such as acrylic or epoxy coatings, or with flexible wall coverings. Enclosure requires use of approved wallboards or paneling that adequately covers the contaminated surface.25 Enclosure and encapsulation, however, does not remove the paint.

Removal also is an accepted method; however, lead-contaminated dust can be generated unless proper procedures are followed. Removal requires the complete stripping or removal of contaminated surfaces and replacement with lead-safe components. Physical removal can be done by wet scraping with mechanical removal methods, with chemical paint removers, or by hand-scraping using a heat gun at recommended levels. On-site removal of lead-based paint requires
worker safeguards, including protective clothing, respirators, personal hygiene protocols, and periodic blood lead testing. The work area also must be isolated in most cases to prevent release of contaminants into other parts of the building and the environment. Removal costs 30 percent to 50 percent more than enclosure or encapsulation.

Title X directs EPA to establish health-based standards to determine when a dwelling is safe from lead hazards, though not necessarily free from lead. These standards permit interim controls. Interim controls are designed to temporarily reduce exposure to lead hazards and may remain in place as long as periodic monitoring of the hazards indicate the controls are still effective. Clearance testing can make interim controls acceptable and effective and can delay, perhaps permanently, the cost of doing an abatement. Interim controls are a strategy used in Maryland, Massachusetts, and Rhode Island.

**Lead in soil and dust.** Lead-contaminated soil and dust have been identified as the second most likely source of exposure. Up to 30 percent of elevated blood lead levels may be due to soil and dust, with household dust being the most common source of low-level poisoning of children. ATSDR estimates that between 5.9 million to 11.7 million children have been exposed to lead from dust and soil, but the agency has no accurate estimates of its effects on the children’s blood lead levels.

Soil and dust are often described as pathways for exposure to lead rather than direct sources, because they become contaminated from other sources. Soil and dust become contaminated through the weathering and chipping of lead-based paint; from scraping, sanding, or renovation activities that break surfaces painted with lead-based paint; from emissions from factories and cars fueled by leaded gas; from solid wastes from industries; Arizona’s Response to Lead in Soil

Because so little blood lead testing has been done, Arizona cannot determine whether lead in paint is a significant problem. However, lead in the soil of smelter communities is a recognized problem. Historically, 52 communities in the state had smelting operations releasing lead into the environment. Since the natural soil lead levels are less than 50 milligrams per kilogram (mg/kg), reports of up to 13,600 mg/kg of soil samples in smelter towns caused alarm.

The state studied three communities with past smelter operations. A representative sample of children under five were screened and soil samples taken. Soil lead levels in the towns of Douglas, where a large smelter operated until 1986, and Bisbee, which had numerous small smelters until 1908, were 254 mg/kg and 337 mg/kg, respectively; soil lead levels were 35 mg/kg in Safford, which closed its small smelting operations before 1900. Corresponding to the soil samples, the children in Douglas and Bisbee had significantly higher blood lead levels than children in the town of Safford. Soil lead and blood lead levels in Bisbee were higher the closer the children lived to the old smelter sites.

The dry climate and desert flora of Arizona also contribute to the problem. Without much precipitation to dilute the lead or lush vegetation to cover the lead-contaminated soil, children come into direct contact with the contaminated soil.

The state responded to this situation by implementing a voluntary screening program for these communities, but because there is little research on the effectiveness of abating lead-contaminated soil in dry climates, the state has been unable to provide much other assistance. It has proved, though, that smelter towns have a higher incidence of lead poisoning caused by lead in soil.
Missouri’s Lead Mines and Smelters Study

Because Missouri produces more lead than any other state, the state has been very concerned about the effects mining and smelting have on their population. The state studied three communities: Jasper County in the southern part of the state; near Herculaneum, just south of St. Louis; and a smelting operation in Glover. All the towns had mining or smelting operations.

The studies done by the Department of Health determined that lead mining per se does not cause elevated blood lead levels, but smelters do significantly contribute. In Jasper, the state studied people living on mine tailings and near smelter sites; these lead levels were compared with those for people who live outside any historical mining or smelting activity. The study, which focused on lead poisoning from soil (as opposed to paint), found that 12 percent to 13 percent of children six years old and younger living near the sites had blood leads above 10 µg/dL.

The Herculaneum study looked at a smelter that has been in operation more than 100 years. Soil within a half mile radius of the smelter had lead levels ranging from 1100 ppm to 2800 ppm. Though the smelter meets EPA ambient air standards, children screened within the half mile radius had a 20 percent incidence of elevated blood lead levels.

The Glover smelter site did not meet EPA’s ambient air standards. Lead soil levels within two miles of the site reached 8500 ppm, and the smelter had been known to emit pollutants 10 times the level allowed by EPA. Not many children live near the smelter, and, therefore, few were found with elevated blood lead levels. However, the nature of the operation raises concerns for the state.
Remediation through soil covering or planting is usually required only if levels are above 1000 ppm-1500 ppm and there is an indication that the affected children actually have direct contact with the contaminated soil. These states have not found removal of soil less than 1000 ppm to have a significant effect.

Though household dust can be reduced by thorough cleaning of the dwelling and continued maintenance, research sponsored by HUD has shown that the lead-contaminated dust and soil in carpeting and furniture cannot be adequately cleaned, and recommends replacement.37

**Lead in drinking water.** Lead contaminates drinking water from two sources: at the source of the supply (contaminated by fallout from air or solid waste) and from corrosion of lead pipes or brass or solder plumbing materials in the water distribution system. Most contamination is from corrosion by-products and is found in older urban areas with lead service lines and mains, lead solder, and brass fixtures.38

The body absorbs lead from drinking water more completely than from food or other substances; and, given the amount of water a body consumes, even a small concentration of lead can cause adverse affects. An estimated 1.8 million children under the age of five are potentially exposed, and approximately 241,000 children under six have blood lead levels above 15 µg/dL from water.39

**Reduction and remediation of lead in drinking water.** EPA has aggressively dealt with lead in drinking water by promulgating regulations limiting the amount of lead allowed in drinking water, banning the use of lead in solder and plumbing components, and requiring the replacement of lead pipes in water systems if they fail to meet a specified testing standard of 15 parts of lead per billion parts of water.40 Through the Safe Drinking Water Act (SDWA) and the Lead Contamination Control Act (LCCA) and their implementing regulations, EPA has effectively worked with states and localities to reduce lead in drinking water through regulatory enforcement and non-regulatory strategies, such as outreach programs to educate consumers and technical assistance to manufacturers.41 However, lead in drinking water remains a problem; and to meet current and future drinking water standards, states and EPA must increase their efforts to eliminate lead.
2. THE STATE ROLE IN REDUCING LEAD EXPOSURE

History of the State Role

Legislatures have focused on lead poisoning prevention several times since 1971. The passage in 1971 of the Lead-Based Paint Poisoning Prevention Act marked the initial federal push to address lead hazards. The act primarily established protocols for dealing with lead-based paint in public housing and required the Centers for Disease Control and Prevention (CDC) to establish standards. During this time states began to recognize the seriousness of lead poisoning and two states—Massachusetts and Maryland—initiated comprehensive programs to address lead poisoning prevention.

As more became known about lead, the federal government, mostly through CDC, encouraged states to undertake screening programs for children in “high-risk” areas (cities with older homes and young families). It also banned lead in gasoline and new residential paints, which significantly reduced the overall release of lead into the environment. Prompted by CDC funding, several states enacted lead paint poisoning and control acts, which granted authority, usually to their health departments, to screen, diagnose, and treat lead poisoning. These statutes allowed states to provide secondary prevention, that is, respond to children already poisoned by lead and provide some remediation. However, they gave little authority to states to prevent poisoning. Screening and remediation legislation was passed in California, Connecticut, Illinois, Kentucky, Louisiana, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, South Carolina, and Wisconsin. These programs flourished until CDC eliminated funding in 1981.

For most of the eighties, lead was not seen as a serious concern. The ban on lead in gasoline and paints significantly reduced overall blood lead levels, from an average of 15 µg/dL in 1976 to around 5 µg/dL in 1991. However, research published in the late 1980s proved that minor levels of lead, even levels as low as 10 µg/dL, could severely harm children under six. This sparked renewed concern about lead poisoning.

In 1988, Congress passed the Lead Contamination Control Act, which authorized CDC to provide grants to states to administer childhood lead poisoning prevention for fiscal years 1990 and 1991. This law also addressed lead in drinking water by requiring states to establish programs to test and eliminate lead in water from schools and day care centers by July 1989 and provide for public notification of drinking water analysis.

Title X: The Residential Lead-Based Paint Hazard Reduction Act of 1992

The Residential Lead-Based Paint Hazard Reduction Act of 1992, Title X of the Housing and Community Development Act, was enacted into law on October 28, 1992. Title X, as it is commonly known, redirects the federal government’s approach to lead poisoning by focusing on lead-based paint, soils and dust in residences, public and commercial buildings, and steel structures. Working mainly through HUD, EPA, and the Occupational Safety and Health Administration (OSHA), Title X establishes a new framework for lead hazard reduction. It imposes specific requirements on federally owned, insured, and assisted housing; authorizes resources to states and local governments to abate lead in homes; mandates requirements for certifying and training contractors and workers, pro-
Protecting workers, certifying laboratories, and accrediting training programs; and raises the public’s awareness of the seriousness of lead poisoning.  

Effect on state programs. Title X effects states both directly and indirectly. Directly, Title X requires states (and metropolitan areas) receiving federal housing and community development funds to consider lead-based paint hazards in their Comprehensive Housing Affordability Strategies. States must outline the actions being proposed or taken to evaluate and reduce lead-based paint and describe how lead-based paint hazard reduction will be integrated into housing policies and programs. Indirectly, Title X authorizes grant money to HUD and EPA to encourage states to adopt training, certification, and accreditation programs “at least as protective” as the federal program. EPA must develop a model state program for states seeking to adopt a training and certification program. States without a program two years after EPA promulgates its model state plan will be subject to an EPA-imposed program.

In addition, Congress authorized under Title X close to $400 million in grants and loans to states and local governments for lead hazard reduction. To receive the funding states must comply with federal lead hazard reduction guidelines, which include a training, certification, and accreditation program.

For 1993, HUD’s criteria for Lead-Based Paint Hazard Reduction grants (58 FR 31848) require states to enact a comprehensive lead program before receiving funds. HUD and EPA defined the minimum set of basic elements that must be contained in a state's enabling legislation:

- **Agency.** Establish an agency or agencies or designate an existing state agency or agencies to implement the state program.
- **Certification.** Authorize and direct the agency to promulgate regulations requiring the certification of contractors who offer to detect or reduce lead hazards.
- **Worker training.** Authorize and direct the agency to promulgate regulations setting training requirements for workers, inspectors, and other persons directly and substantially involved in lead-based paint activities. The regulations must establish minimum acceptable levels of training and periodic refresher training for each class of workers and require that training be provided by accredited training providers.
- **Accreditation of training providers.** Authorize and direct the agency to promulgate regulations to establish the accreditation of training programs, including the following:
  - Minimum requirements for the accreditation of training providers
  - Minimum training curriculum requirements
  - Minimum training hour requirements
  - Minimum hands-on training requirements
  - Minimum trainee competency and proficiency requirements
  - Minimum requirements for training program quality control
- **Standards.** Authorize and direct the agency to promulgate regulations establishing standards for performing lead-based paint activities, taking into account reliability, effectiveness, and safety.
- **Compliance.** Authorize and direct the agency to promulgate regulations that will require any activity involving lead hazard detection or reduction procedures to comply with agency regulations and to use certified and accredited personnel.
- **Enforcement.** Authorize and direct the agency to promulgate regulations that provide for the enforcement of the State Certification Program and that establish suitable sanctions for those who fail to
Massachusetts’ Childhood Lead Poisoning Prevention Program

Massachusetts’ comprehensive program began in 1974, three years following the enactment of their Childhood Lead Poisoning Prevention Act, which gave the Department of Health the authority to “establish a statewide program for the prevention, screening, diagnosis, and treatment of lead poisoning.” Since that time the Childhood Lead Poisoning Prevention Program (CLPPP) has become the nation’s most comprehensive program addressing lead poisoning prevention.

CLPPP requires annual screening of all children under six by physicians and health care facilities. Children considered at high risk are screened more frequently. Physicians, health care providers, and laboratories report cases of elevated blood lead levels in children to the director of CLPPP.

Upon receipt of a confirmed case, the program must conduct an inspection of the child’s home, determine whether the home has dangerous levels of lead, and, if dangerous levels are found, require the property be abated. An abatement makes lead-contaminated paint, plaster, or other materials inaccessible to children under six by either removing, replacing, or covering the contaminated surface. Preventive abatement is required whenever a child under six resides on the premises, but CLPPP can order abatements if a child under six who is at significant risk spends time at a dwelling or if someone with elevated blood lead affecting his or her cognitive development resides there.

Abatements and inspections must be done by certified professionals who are specially trained in the procedures mandated by the state. Follow-up inspections will be conducted to ensure that lead levels remain low.

Results of this aggressive approach are encouraging. Overall blood lead levels have fallen, and even with the lowering of the blood lead standards and the advent of universal screening, the state’s caseload of poisoned children has declined. The program continues to address the difficult issue of preventive abatement of lead hazards and is furthering its educational outreach efforts.
Comprehensive State Programs for Lead Poisoning

Elements of a comprehensive program generally include surveillance, screening, reporting, public outreach, and medical and environmental case management, which encompasses inspections, risk assessments, remediation or abatement of lead hazards, and disclosure of lead hazards. By establishing a comprehensive program, states can remediate the sources of lead exposure as well as identify and treat children with elevated blood lead levels.\textsuperscript{52} California, Connecticut, Georgia, Illinois, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Hampshire, New Jersey, Ohio, Rhode Island, Vermont, Virginia, and Wisconsin have enacted comprehensive lead poisoning prevention programs addressing most of the elements listed above (see table 3).

Earlier state and federal laws focused on health-based, or secondary prevention rather than hazard abatement or primary prevention.\textsuperscript{53} Secondary prevention is reactive; programs are triggered and hazards remediated after a child has been poisoned. Primary prevention is proactive, requiring homeowners and landlords to remediate hazards before a child is poisoned. Primary prevention programs are encouraged by Title X and CDC, but require administration and enforcement by the state and shift the financial burdens onto property owners, homeowners, and others involved with the residential housing community.

Surveillance. States identify the extent of lead poisoning from 1) screening data of blood lead levels, 2) environmental surveys designed to identify common sources of lead exposure, and 3) demographic data identifying common factors that indicate elevated

<table>
<thead>
<tr>
<th>States With Comprehensive Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surveillance</strong></td>
</tr>
<tr>
<td>California</td>
</tr>
<tr>
<td>Connecticut</td>
</tr>
<tr>
<td>Georgia</td>
</tr>
<tr>
<td>Illinois</td>
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<td>Louisiana</td>
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<tr>
<td>Vermont</td>
</tr>
<tr>
<td>Virginia</td>
</tr>
<tr>
<td>Wisconsin</td>
</tr>
</tbody>
</table>

Source: NCSL 1994 Survey of State Programs
California’s Lead Screening Programs

As part of a settlement to a lawsuit brought against the state, routine screening is now required for all children under the Child Health and Disability Prevention program (CHDP), which covers approximately two million children under the age of six, and in the state’s Early Periodic Screening, Diagnostic, and Treatment (EPSDT) program under Medicaid.

In the first six months of this directive, more than 82,000 blood lead tests were conducted. These numbers continue to grow dramatically each month as more providers implement the new guidelines and recommendations. The number of screenings now reach 12,000 - 15,000 tests per month.

The results show the breadth of the problem. In 1992, the state identified more than 550 new cases of serious childhood lead poisoning above 25 µg/dL, whereas in the past only 40 cases per year were discovered. Twelve percent of the children identified had blood lead levels between 45 µg/dL and 69 µg/dL, and 2 percent had levels above 70 µg/dL. These results indicate severe lead poisoning and usually require hospitalization and urgent medical treatment.

Blood lead levels. All three are necessary to provide a complete portrait of lead poisoning.

Screening can provide the most accurate portrayal of blood lead levels, but most screening is limited to target areas and populations, and universal screening of all children is rare. Environmental surveys determine common sources of lead exposure, such as lead-based paint, lead in dust and soils, and lead in drinking water, to estimate the number of poisoned children. States base their estimates on the concentration of lead in a particular source, the amount of lead that source releases, and the number of children who come into contact with the released lead.

Demographic data also are used to define areas with a high likelihood of lead poisoning, or “high-risk areas.” Relevant factors that indicate a high-risk area include: the age of the housing, income levels, socioeconomic status, ethnicity of the residents, population, and the number or density of preschool-aged children in the area. Although environmental surveys and demographic data provide a reasonable alternative, neither can match the accuracy of direct, universal screening.

Screening programs. Individual screening of children documents blood lead levels most accurately. CDC recommends that all children under six be tested at least once and more often if they are considered a high risk because they 1) live in old, decaying housing built before 1960, 2) live in high-density urban areas or near major roadways, or 3) live near smelters or other industrial complexes that use or process lead. To meet CDC’s recommendations, 16.4 million pediatric tests will have to be performed yearly.

The preferred screening method is direct blood lead measurement. Formerly, physicians measured erythrocyte protoporphyrin (EP) to determine the level of lead in blood. However, EP is not sensitive enough to detect levels below 25 µg/dL and often fails to detect blood lead even at higher levels. The more precise direct testing of blood lead requires detailed procedures and laboratory analysis that better ensure the accuracy of the test.
Twenty-nine states have some sort of screening program (see figure 4). Seventeen states statutorily mandate screening of children either in high-risk areas, before entering day care, or by pediatricians.

State screening programs began in 1971 and were supported by federal funds under the Lead-Based Paint Poisoning Prevention Act. Screening done pursuant to federal mandates focused on children considered at high risk with a likelihood of elevated blood lead at a level warranting medical attention, at least above 25 µg/dL. This method was effective in finding the children most severely harmed by lead.

Current screening programs are broadening their focus to screen children outside of high-risk communities and to identify blood lead levels as low as 10 µg/dL, an approach that will command more extensive resources to discover low-level lead poisoning.

**Reporting requirements/state registry.** Lead poisoning is a reportable disease in 38 states. Reporting of lead poisoning assists states in determining the extent of the problem, though often the data collected identify only a portion of the total number poisoned since a majority of states rely on voluntary screening for reporting purposes.

Two groups are required to report: physicians and laboratories. Physicians can report blood lead levels above 25 µg/dL using the EP test, but must wait for results from a lab if testing for levels below 25 µg/dL using the direct

![Figure 4](image-url)
Maryland's Lead Registry

Maryland established its Childhood Lead Registry (CLR) in 1986 requiring medical laboratories to report all blood lead tests for lead screening of Maryland's children between one year and 18 years of age. Since 1990, when the CLR was computerized, there have been 218,979 reported screening tests.

The CLR is an in-house, PC-based computer system that receives reports both electronically (from three private labs and the state lab) and on hard copy (from other private labs). Reports of elevated blood lead levels are phoned or faxed to the CLR to facilitate public health case management by the community health nurses housed in local health departments and who serve as case managers for children with blood lead levels equal to or greater than 20 µg/dL.

Lead screening is required for Early Periodic Screening, Diagnostic, and Treatment (EPSDT) children and recommended for all others, though a majority of children between birth and 6 years have not been tested. However, because of public awareness screening reports have been multiplying, from 60,109 in 1990 to an estimated 112,000 in 1993. The state is preparing for a 100 percent reporting increase in the coming years.

Because more than half the children screened in 1990 were discovered to have lead levels in excess of 10 µg/dL, Maryland has found the CLR essential for tracking lead poisoning and facilitating medical management.

Public outreach and education. One of the most critical and commonly practiced components of states’ lead poisoning prevention programs is public outreach. Title X requires EPA to publish a lead hazard information pamphlet designed to inform the public on the health risks associated with lead exposures, the presence of lead in target and federally assisted housing, and the risks involved in renovating or remodeling a dwelling. EPA has already printed and distributed Lead Poisoning and Your Children, which discusses general problems with lead in residences, and Lead Based Paint: Protect Your Family. CDC, HUD, and EPA also have many other summaries and pamphlets describing different aspects of lead poisoning and state and federal programs, and the National Lead Information Center has a clearinghouse and a hotline to answer questions on lead: 1/800/LEADFYI [1(800)532-5323-394] for the hotline, 1(800)424-LEAD [1(800)424-5323] for the clearinghouse (see appendix E).

Thirty-six state agencies responsible for public health have information regarding lead and ways to prevent poisoning. Distribution, however, is often limited to specific health care clinics, and the information sometimes fails to reach the people most likely to have lead-poisoned children.

CDC recommends that outreach and education programs target local officials, healthcare providers, parents, property owners, day care providers, and early childhood educators through pamphlets and written materials, media outlets, public meetings, school programs, and social service agencies.
Medical and environmental case management programs. When a child is identified with an elevated blood lead level or as living in a high risk area, the state may track that child and provide case management. Case management encompasses medical follow-up (health education and making certain that the child is properly treated for the lead) and environmental activities (reducing exposure to the sources of lead poisoning).

Medical case management programs prescribe specific treatment for poisoned children to reduce lead levels based on a child’s blood lead concentration (see table 4). Treatment involves pediatric evaluations, continued monitoring of blood lead levels, and dietary supplements to reduce lead exposure and lessen the effects of poisoning. Most important, it provides the necessary intervention for children to reduce their blood lead levels.

Public health case management is publicly financed programs in which nurses go to homes to educate parents about the sources, effects, and prevention of lead poisoning, and provide continued oversight and support to ensure that lead hazards are remediated and poisoning does not reoccur.

Most medical management programs are provided at the local level but rely on state and federal funding. Medicaid’s Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) program provides screening for lead and treatment for poisoning to children it covers, but states or the private sector must handle treatment for the remainder of children. State health budgets often are not in a position to provide for extensive treatment programs.

If elevated blood lead levels persist, healthcare providers may recommend, or require if they have the authority, that environmental case management be undertaken. Environmental case management, also called environmental follow-up, investigates a child’s environment, meaning home, play areas, and school, to discover the source of the lead exposure. Environmental case management allows states to investigate the child’s environment, usually the home, to determine areas or surfaces releasing unacceptable amounts of lead, take emergency and long-term action to reduce lead exposures, and evaluate the efficacy of the intervention. This can include everything from testing for lead-based paint in the home to studies of soils in playgrounds. Often case management is limited to a simple inspection of the child’s home to identify obvious sources of exposure, such as chipped paint, painted windows or door jambs, or drinking water. CDC, however, recommends thorough and immediate investigation and

<table>
<thead>
<tr>
<th>Lead Level (mcg/dL)</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 9</td>
<td>Not considered lead-poisoned</td>
</tr>
<tr>
<td>10-14</td>
<td>Community prevention activities and frequent rescreening</td>
</tr>
<tr>
<td>15-19</td>
<td>Individual case management, and environmental investigation if condition persists</td>
</tr>
<tr>
<td>20-44</td>
<td>Medical evaluation and environmental intervention</td>
</tr>
<tr>
<td>45-69</td>
<td>Medical and environmental interventions</td>
</tr>
<tr>
<td>70 plus</td>
<td>Immediate medical and environmental interventions</td>
</tr>
</tbody>
</table>

Source: U.S. Centers for Disease Control and Prevention, “Preventing Lead Poisoning in Young Children” (October 1991).
remediation of the environment, especially if the poisoning is severe.  

**Inspections/risk assessments.** Case management limits inspections to residences with poisoned children, but states with preventive programs expand inspection requirements to cover child care facilities, property being rented or leased to persons with young children, or private property upon sale. These inspections identify the presence of lead-based paint, soils, and dusts. Some states, and Title X, provide for risk assessments to determine the severity of the lead exposure hazard.

“Risk assessment,” as defined by Title X, means “an on-site investigation to determine and report the existence, nature, severity, and location of lead-based paint hazards in dwellings,” including information regarding the age and history of the housing and occupancy by children under six, a visual inspection, limited wipe or other environmental sampling techniques, and a report explaining the results of the investigation.  

Title X recommends risk assessments of target housing (housing built before 1978) and in public buildings and encourages states adopting the EPA program to provide for risk assessments as well.

**Remediation or abatement of lead hazards.** Results of the risk assessments and inspections usually determine the recommended response, either interim control or abatement. Preventive programs require owners to remediate lead hazards (using certified professionals) or be subject to penalty. Massachusetts imposes strict liability on residential owners refusing to abate.

Abatement standards are not universal among state programs. Abatement technologies are continually evolving, and EPA is working to establish performance standards for lead-based paint activities. In the past states have had to struggle to identify what constitutes proper “abatement” or “interim control,” leaving the public uncertain about whether their state’s guidelines are sufficient to make their dwelling lead-safe. For federal public housing, “abatement” means the removal of all lead-based paint; under Title X, “abatement” encompasses measures designed to permanently eliminate lead-based paint hazards, including removal, replacement, and encapsulation controls to limit hazards. “Interim controls” under Title X are measures “designed to reduce temporarily human exposure or likely exposure to lead-based paint hazards,” including cleaning, repairs, maintenance, and ongoing monitoring of lead hazards (see appendix A). Most states are looking to EPA to set the final standard.

**Disclosure of lead hazards.** Disclosure of known lead hazards in housing assists state and local governments, investors, mortgage companies, potential buyers, and the real estate community when working with a property. A registry of homes with known lead hazards facilitates a state’s poisoning prevention efforts, and several states (and Title X, section 1018 after the promulgation of final regulations) require reporting of the results of lead inspections. Disclosure not only provides owners, occupants, mortgagees, and lienholders with an understanding of the hazards that exist, but also puts them on notice regarding potential liability from investing in a building with lead hazards.

Under Title X, all lead-based hazards must be disclosed upon the sale or lease of any target housing and the purchaser or lessee must be given a lead hazard information pamphlet. The purchaser must also have the option of conducting a risk assessment or inspection to determine the presence of any lead-based hazards before becoming obligated under a contract to purchase the house.
3. TRAINING, CERTIFICATION, AND ACCREDITATION

Training and certification programs ensure that only qualified professionals inspect, assess, and remediate homes, residences, and other structures with lead-based hazards. Accreditation of training programs ensures that these professionals are trained in qualified courses. Certification, an official recognition that a person has been adequately trained and has fulfilled state (or federal) requirements to work in a profession, provides an assurance of competency to perform inspection and abatement activities. Currently, 20 states mandate training and certification of all lead abatement contractors and inspectors. Two years following promulgation of the federal regulations, the federal government will require all persons doing lead abatements, risk assessments, or inspections to be trained by an accredited training provider and certified by a state or EPA.

Certification confirms licensure on individuals to perform lead abatements, risk assessment, or inspection within a state. Training by an accredited training provider is a necessary precursor to certification.

**Training Programs**

In a report to Congress, HUD concluded that untrained abatement contractors increase, rather than diminish, the danger from lead exposure and recommended training for all.

**Maryland’s and Massachusetts’ Accreditation Program**

Both Maryland and Massachusetts pioneered programs to accredit lead abatement contractors and inspectors. Massachusetts began the accreditation process in 1989 and has the most experience in lead-related training and certification. Administration of its program is conducted by two agencies: the Department of Health, which accredits inspectors, and the Department of Labor and Industries, which accredits contractors and workers.

Massachusetts’ inspector training lasts a minimum of 2 1/2 days, followed by an one-hour exam. Upon successful completion of the course, a person must complete an apprenticeship to a master inspector. After the apprenticeship, the person may apply for an inspector’s license and become certified to inspect for lead.

Abatement workers and contractors also must undergo training and an exam but do not need to become apprentices before licensure.

Maryland established training requirements in 1988 within the provisions of the state’s lead-based paint abatement regulations for residential and child care structures. Under these regulations, the Maryland Department of the Environment (MDE) reviews and approves training programs, and certifies workers, inspectors, and contractors; MDE also trains and certifies state and local agency employees as abatement inspectors.

Maryland’s Occupational Safety and Health Lead in Construction regulations, effective in 1986, include training provisions. To satisfy requirements under Title X, Maryland’s new law requires that persons exposed to lead while working on structural steel also meet more stringent training and accreditation requirements.
persons directly involved with testing and abatement, including architects, engineers, abatement contractors, abatement workers, and lead inspectors. Others HUD has identified as benefiting from lead training include government administrators, property owners and managers. Congress reacted by mandating under Title X that persons who inspect, assess risks, or are directly involved with abatement activities be trained and certified.

Lead inspection, assessment, and abatement training courses have operated for several years. Programs specializing in certifying contractors for work in Massachusetts and Maryland have been in existence since the mid-1980s, and general training programs have been teaching safe practices in lead abatement and inspection in many parts of the country.

Yet new technology and new theories have raised questions about current training programs. Lead inspection and abatement is an evolving science, and discrepancies have emerged between training courses regarding the proper method. Questions about the effectiveness of encapsulation versus removal, use of sodium sulfide rather than an X-ray fluorescence (XRF) analyzer to detect lead, and the use of new technologies have left training providers and state administrators struggling to determine the best techniques to present.

In response, EPA initiated development of model courses that standardize curricula for training lead identification and control professionals. EPA has developed model curricula for supervisors, contractors, and inspectors. A course for abatement workers is complete and will be available for distribution shortly. Additionally, a course for risk assessors will be started soon. EPA sponsors five regional lead training centers (RLTCs). The RLTCs established consortial links with other universities and community colleges, state lead programs, labor organizations, and nonprofit organizations to provide lead abatement training that is accepted, though not approved, by EPA at sites throughout the country. The model curriculum is available through the HUD user service (see appendix C).

Elements of a Lead Inspection, Assessment, and Abatement Training Program

HUD identified what it considers to be the basic components necessary for training of lead inspection and abatement professionals to work in HUD housing. HUD requires training in:

- **Possible routes of exposure to lead**—knowledge of how fetuses, children, and adults become exposed and the types and meaning of tests to determine lead poisoning and other exposures.
- **Known health effects associated with exposure**—the types of tests to determine lead exposure, the adverse health effects lead may cause, corresponding blood lead levels, symptoms of lead poisoning, medical reaction to lead poisoning, and the conditions requiring medical treatment.
- **Importance of good personal hygiene during lead hazards reduction**—refrain from eating, drinking, smoking, and applying cosmetics; use of showers and thorough washing; and other practices to prevent the transfer of lead to the worker’s home, car, or environment.
- **Specific methods of abatement to be used**—the relevance and effectiveness of various abatement methods; the appropriateness of using different technologies on various surface conditions.
- **Proper use and maintenance of protective clothing and equipment**—the proper procedures for dressing and undressing to prevent contamination; respiratory protection covering fit-testing and main-
Maintenance; and employers ultimate responsibility for the proper use and maintenance of their workers’ protective clothing and equipment.

- **Correct use of engineering controls and implementation of good work practices**—the importance of good work practices such as measures for controlling and containing debris and other housekeeping measures.

- **Other health and safety considerations**—a review of all health and safety precautions, including working with local building and housing codes to avoid standards that may conflict.\(^7\)

Training following the HUD guidelines for supervisors and planners is more stringent than training for workers, and persons trained in asbestos abatement are not seen as automatically qualified to perform lead removal. HUD notes that classroom instruction should not be seen as a replacement for on-the-job training, but rather as a supplement to it.\(^7\)

**State Training, Certification, and Accreditation Programs**

States pioneered programs to accredit professionals who inspect or abate homes with lead-based paint. **Massachusetts** began licensing inspectors and “deleaders” (abatement professionals) in 1989. Previously, noncertified contractors could abate lead hazards from a dwelling; the state had no control over techniques used during the abatement. Since household dust is a primary contributor to lead poisoning, many units were found more dangerous after the abatement than before. Such concerns prompted the state legislature to pass the licensing requirements.

**Maryland** also requires certification of people who inspect or perform abatements. The state accredits training providers, abatement workers, and inspectors. These requirements were effected in response to the large number of residences being abated (especially in Baltimore) without the proper oversight and controls necessary to properly reduce the lead hazards. Education and specialized training were the only way to limit the number of inadequately performed projects.

**California’s** Department of Health Services established a training and certification program in 1993. The state requires seven hours of lead-awareness training for all accredited disciplines, in addition to specific training. Currently, accreditation is voluntary, but the state may make it mandatory in the future. **Connecticut** passed legislation in 1987 but was unable to promulgate the regulations until September 1992, one month before Congress enacted Title X. The Legislature revised its law in 1994 to come into compliance with Title X.

**Rhode Island** enacted and implemented detailed training and accreditation requirements for contractors, site supervisors, workers, and inspectors. **Arkansas, Georgia, Louisiana, Maine, Missouri, New Hampshire, New Jersey, Ohio, Vermont, Virginia, and Wisconsin** enacted legislation and are implementing programs; **Michigan, New York, North Carolina, and Pennsylvania** must pass and implement training and certification requirements to meet the criteria of their HUD lead-abatement grant.\(^8\) **Oklahoma** requires certification of individuals working state- or federally assisted housing, and **New Mexico** passed a memorial resolution recommending a certification program. **Minnesota** requires only licensed contractors and certified workers may conduct residential lead abatement, and **Illinois** requires accreditation of inspectors, contractors and workers. (See appendix B for more information.)
Section 402—Lead-Based Paint Activities
Training and Certification

The passage of Title X made training and certification of lead inspection and abatement professionals a national concern (see figure 5). Title X mandates EPA to promulgate regulations regarding the accreditation of training programs and certification for workers, supervisors, inspectors, planners, and other individuals involved with lead-based paint activities. As stated in section 402(a) of Title X, EPA must:

Promulgate final regulations governing lead-based paint activities to ensure that individuals engaged in such activities are properly trained; that training programs are accredited; and that contractors engaged in such activities are certified.\(^81\)

The act specifically requires EPA to establish:

- Minimum requirements for the accreditation of training providers
- Minimum training curriculum requirements
- Minimum training hour requirements
- Minimum hands-on training requirements
- Minimum training competency and proficiency requirements
- Minimum requirements for training program quality control\(^82\)

These regulations also will include standards for performing lead-based paint activities, taking into account reliability, effectiveness, and safety.\(^83\) The regulations must specify requirements for accrediting training pro-

Figure 5
States with Lead Training, Certification, and Accreditation Statutes in 1994

Source: National Conference of State Legislatures, 1994
grams for workers, supervisors, inspectors, risk assessors, and planners/project designers; establish requirements for certifying contractors; and ensure that all risk assessments, inspections, and abatement activities in target housing are performed by certified contractors.

**Inspection, Risk Assessment, and Abatement Requirements Under Section 402**

Congress sought to build a trained workforce nationally by requiring that certain federally owned housing or housing receiving federal assistance be inspected and abated by certified workers, and provided funding to inspect, assess, and abate private residences.

Congress identified two types of structures subject to Title X requirements:

- **Target housing** (any housing constructed before 1978, except housing for the elderly or persons with disabilities or any zero-bedroom dwelling), which is subject to risk assessments, inspections and abatements; and

- **Public buildings** constructed before 1978, commercial buildings, bridges, or other structures or superstructures, which are subject to regulations covering identification of lead-based paint and materials containing lead-based paint, deleading, removal of lead from bridges, and demolition.

Federally owned target housing that is sold by any federal agency, rehabilitated with federal funds, or assisted with a project-based subsidy are subject to inspection and abatement requirements. Public housing must be inspected and, if necessary, abated of all lead-based paint in the course of modernization.

Title X’s inspections and abatement requirements also cover target housing receiving more than $5,000 in project-based assistance under any federal housing or community development program. Units being sold by the Resolution Trust Corporation are subject to inspection and abatement requirements. All federal facilities, including housing owned by the Department of Defense and other federal agencies, are subject to Title X’s mandates.

**State Implementation of Section 402**

Section 404(d) directs EPA to develop a model state program that states may adopt to administer and enforce the standards, regulations, and requirements of section 402.

To receive authorization, states must submit their proposed program to EPA for review. If the state program is “at least as protective of human health and the environment as the Federal program... and such state program provides adequate enforcement,” then a state is eligible to apply for EPA approval of its program. Congress used this terminology to allow states more flexibility in developing their programs. Upon approval, the state receives the authority to administer and enforce the training, certification, and accreditation provisions of Title X. Any state without an approved program two years after final promulgation of these regulations will be subject to an EPA-administered and -enforced training, certification, and accreditation program.

EPA has compelling reasons to want states to administer training, certification, and accreditation programs. Congress intended the training and certification portions of Title X to be administered by states. EPA cannot realistically administer a program that is best suited to be implemented at the state level.
States can develop rules that reflect local geographic and economic concerns, incorporate the interests and specific needs of their population, and provide effective responses to specific concerns raised by training programs, the workforce, and their citizens. They are in a better position to monitor training, inspect lead abatement operations to ensure proper techniques are applied, and provide effective enforcement against unqualified individuals or improperly performed abatements.\textsuperscript{90}

HUD has the responsibility for ensuring that public housing authorities follow the federal lead-based paint guidelines (currently under revision as required by Title X). Public housing authorities are required to understand and comply with state and local regulations regarding testing, abatement, worker protection, and disposal of the waste. Enforcement by states of federal standards assists in coordinating efforts to reduce lead hazards in federal housing. State regulations also may apply to state-supported or private housing in the state.\textsuperscript{91}

**State Authority Over Federal Facilities and Properties**

Congress specifically addressed whether state and local training and certification requirements apply to federal facilities in Title X. Title X states:

\begin{quote}
Each department, agency, and instrumentality of executive, legislative and judicial branches of the Federal Government (1) having jurisdiction over any property or facility, or (2) engaged in any activity resulting, or which may result, in a lead-based paint hazard, and each officer, agent, or employee thereof, shall be subject to, and comply with, all Federal, State, interstate, and local requirements, both substantive and procedural, (including any requirement for certification [and] licensing).\textsuperscript{92}
\end{quote}

Any reasonable licensing and certification fees may be assessed on persons or agencies working on or for a federal facility or property. This section also waives any immunity “otherwise applicable to the United States” with respect to any substantive or procedural requirements.

**Training and Certification of Renovators and Remodelers**

Section 402(c) requires EPA to promulgate guidelines for renovators and remodelers to limit exposure from lead created by their activities. EPA is to disseminate these guidelines through state and local agencies, hardware and paint stores, employee organizations, and trade groups.\textsuperscript{93}

EPA is also required to study the extent of lead exposure caused by renovations and remodeling and determine whether such activities should be subject to training and certification requirements. Revisions to their regulations incorporating these finding are due by 1997. States will likely be requested to revise their training and certification requirements to meet EPA’s renovation and remodeling requirements. Therefore, states may seek authority to address renovation and remodeling activities in their enabling legislation.

**Fees for Training, Certification, and Accreditation Programs**

Title X requires EPA or any authorized state to impose fees on persons operating accredited training programs and contractors certified to perform lead-based paint activities. The amount must cover the cost of administering and enforcing the standards and regulations applicable to such programs and contractors. The act, however, forbids fees being imposed on any state, local government, or nonprofit training organization. Fees may be waived against contractors with their own accredited training program training their own employees.\textsuperscript{94}
4. FUNDING OPTIONS FOR STATE LEAD POISONING PREVENTION PROGRAMS

Effective lead poisoning prevention programs need sustainable and sufficient resources for operation and enforcement. Federal funds support a majority of state screening and medical follow-up programs; only half the states use any state funds for either program. In contrast, most states use their own funds for environmental investigations, and less than half have federal support for this activity. For abatement activities, local and other sources, including private financing, provide most of the money, although Title X increases federal funding substantially for lead-based paint abatement.95

The cost of reducing lead poisoning is enormous. HUD estimates the average cost to abate a home is $2,500; more than $10,000 is necessary for units with serious lead-based paint hazards (see tables 5, 6, and 7). The average cost of testing alone for lead-based paint is $375 per unit.96 To implement CDC’s recommended childhood lead poisoning prevention activities, which include screening, educational materials, and outreach and infrastructure development, will cost states, local government, and the federal government an estimated $913 million over the next five years.97

This section presents alternative funding mechanisms used or proposed by states to finance lead poisoning prevention programs, provide assistance to private homeowners for abatement, and assist local governments with their lead poisoning prevention activities. Four funding activities are discussed: state fees and taxes, state loans and grants, bonds, and federal loans and grants. These methods support the operation of programs independent of general appropriation funding, and they can generate revenue beyond the cost of the programs. Most states use such methods to support their lead poisoning prevention programs.98

<table>
<thead>
<tr>
<th>Cost Range</th>
<th>Encapsulation</th>
<th>Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $2,499</td>
<td>54.4%</td>
<td>54.7%</td>
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<tr>
<td>$2,500 - $4,999</td>
<td>13.3%</td>
<td>11.8%</td>
</tr>
<tr>
<td>$5,000 - $9,999</td>
<td>13.9%</td>
<td>5.6%</td>
</tr>
<tr>
<td>$10,000 - $14,999</td>
<td>8.2%</td>
<td>8.9%</td>
</tr>
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<td>$15,000 - $19,999</td>
<td>3.5%</td>
<td>8.4%</td>
</tr>
<tr>
<td>$20,000 - $24,999</td>
<td>1.9%</td>
<td>1.4%</td>
</tr>
<tr>
<td>$25,000 and over</td>
<td>4.7%</td>
<td>9.2%</td>
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</table>


<table>
<thead>
<tr>
<th>Abatement Strategy</th>
<th>Units With Exterior Lead-Based Paint Only</th>
<th>Units With Interior Lead-Based Paint Only</th>
<th>Units With Both Exterior and Interior Lead-Based Paint</th>
<th>All Units With Lead-Based Paint</th>
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</thead>
<tbody>
<tr>
<td>Encapsulation</td>
<td>$2,841</td>
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<tr>
<td>Removal</td>
<td>$4,791</td>
<td>$1,808</td>
<td>$11,720</td>
<td>$7,704</td>
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</table>

Source: HUD, Comprehensive and Workable Plan for the Abatement of Lead-Based Paint in Privately Owned Housing (Washington, D.C., 1990)
Special fees or taxes beyond the state’s general revenues provide independent support for programs and are the most popular form of alternative financing. Fees, which impose a flat rate as a condition of doing business or operating an agency, place the costs of the program directly upon the immediate beneficiaries. Taxes are a compulsory levy based on a per unit calculation and provide no direct service to the payer. These distinctions are important because taxes are often subject to legislative or regulatory restrictions that fees are not.

States often establish fees for specific regulatory actions (e.g., inspections, permit review, licensing) to place the cost of administration on the affected communities. Many states allow fees to be administratively imposed without legislative approval. Most require that fees not exceed the cost of providing the service and the ability of the affected community to pay. Fees may be placed in a general fund, with specific programs supported by the amount, or earmarked specifically for lead poisoning prevention activities. Because revenues from fees are based on a specific regulated community, fees are effective only if the community can support the program.

Taxes are independent of services and must be levied equally upon all persons subject to them. Tax revenues generally go into the general fund unless specifically earmarked for certain programs, and they can be used for a wider variety of activities than fees because they are not tied to a service. In most jurisdictions, new taxes require legislative approval.

California’s lead poisoning case management program is funded by a fee assessed on industries responsible for lead contamination based on their market-share in the “stream of commerce” (see sidebar). The legislature tried to pass a bill to place a 50 cents per gallon tax on all paint sold at retail, but it was found unconstitutional. The state did pass an occupational lead poisoning prevention program supported by fees paid by employ-

---

### Table 7

<table>
<thead>
<tr>
<th>Lead Hazard Criterion for Abatement</th>
<th>No. of Units to be Tested (millions)</th>
<th>No. of Units to be Abated (millions)</th>
<th>Annual Testing Cost ($ billions)</th>
<th>Annual Abatement Cost ($ billions)</th>
<th>Total Annual Cost ($ billions)</th>
<th>Encapsulation</th>
<th>Removal</th>
<th>Encapsulation</th>
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<td>Lead in paint</td>
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<td>60.8</td>
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<td>$36.3</td>
<td>$49.9</td>
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<tr>
<td>Lead in paint and either lead dust or nonintact paint</td>
<td>82.3</td>
<td>21.2</td>
<td>3.1</td>
<td>18.8</td>
<td>21.9</td>
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<td>Lead in paint and either lead dust or nonintact paint and child present</td>
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<td>7.6</td>
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California’s Fee-Based Program

In 1991, the California Legislature enacted the Childhood Lead Poisoning Prevention Act, which, among other things, required the state Department of Health Services to impose a fee on the manufacturers and other persons engaged in the “stream of commerce of lead or products containing lead . . . which have significantly contributed . . . to environmental lead contamination.” 107

This language gave the Department of Health Services the difficult task of determining which manufacturers this fee applies to and how much to charge. The agency responded to this dilemma by researching U.S. Bureau of Mines reports which indicate those industries that consumed lead historically. According to this data, gas and oil companies used approximately 85 percent of all lead consumed in the state, and paint manufacturers consumed the remaining 15 percent. Fees of $20,000 were assessed against companies who continue to release lead into the air, based on the Toxic Release Inventory under SARA III.

The second dilemma, how much to charge, forced the agency to calculate the budget to operate the program. For fiscal year 1993 - 1994, the state budget for case management activities came to approximately $12 million. By using the data on historical consumption and applying them against the operating budget, the calculation resulted in a .07 cent fee on each gallon of gas sold in the state and two cents a gallon on paint. For every pound of lead released into the air, about $1 was assessed.

This fee went into effect on April 1, 1993, and, because it is a fee based on the department’s operating budget, it must be reassessed yearly. The funds generated will completely support the state’s case management program.

Maryland charges fees to approve training courses and certify abatement workers, contractors, and inspectors. In 1992 the Legislature established the Lead Paint Poisoning Commission to investigate the feasibility of an alternative compensation system for lead poisoning that would decrease liability for rental property owners if they perform maintenance that prevents lead poisoning.

Massachusetts’s licensing program imposes annual fees of $300 on inspectors and deleaders (abatement workers) and $600 on contractors. These fees go into the general fund, and the program is supported through a general appropriation. A $1,500 tax credit has been established for private property owners doing lead-based paint abatement for each unit abated, which may be applied against a resident’s general tax obligation. A bill to provide a $10 surtax on all property transfers to finance educational outreach programs failed in the Legislature.

Illinois assesses a fee on laboratories performing blood lead analysis to support its program.

State Loans to Finance Abatements

State loan programs provide capital for specific activities at a subsidized rate. Often, states limit the offer of loans to certain parties...
meeting established criteria. Loans generally do not require voter approval or have statutory restrictions; however, loans do not have a specified revenue source to generate the capital. The cost of abating lead has persuaded Massachusetts and Maryland to establish loan programs to assist private homeowners.

Massachusetts' Housing Finance Agency (MHFA) has begun the "Get the Lead Out" program to provide low- and no-interest loans for owner-occupied residential units to abate lead paint. MHFA sold tax-exempt bonds to finance the program, which provides loans with 5 percent to 8.5 percent interest to moderate-income owners needing to abate and no-interest loans to owners with lead poisoned children currently residing in a unit. As loans are repaid, the funds can be reused for additional low-interest loans. Since fall 1992, $500,000 has been loaned to 50 owner/occupiers.

MHFA also administers the Home Improvement Loan Program, which provides loans at 3 percent to 8 percent interest for rehabilitation and improvements of owner-occupied residences; the money can be used for lead abatement.

Massachusetts' Housing Partnership initiated a loan guarantee program in fall 1993 to encourage private lending institutions to provide loans for the abatement of investor-owned housing, with $1 million dedicated to the loan guarantee fund.

Maryland's Community Development Agency (CDA) has the authority to provide loans for lead-based paint abatement in residential properties. The program operates through local governments, which administer the funds. Special projects, such as the evaluation of alternative lead abatement strategies, may receive special allocation of funds. For 1994 the Legislature appropriated $450,000 for the loan program.

The state appropriated more than $5.7 million for lead abatement loans.

Loans of up to $15,000 per unit may be used in single family and multifamily properties serving low-income occupants, with an interest rate of 0 percent-7 percent. If the borrower has an income below 50 percent of the area's median income or the affected household makes 80 percent of the median, the loan is forgiven. Owners of buildings housing services for children (e.g., day care providers) may receive loans for abatement at 7 percent interest. Properties receiving loans must meet the state's post-abatement clearance standard.

Bonds to Finance Lead Poisoning Prevention

Bonds are a written promise to repay borrowed money on a definite schedule and usually at a fixed rate of interest for the life of the bond. States use bonds to finance capital expenditures and repay the debt with taxes, fees, or other sources of governmental revenue. Though bonds cannot be used for operating agencies on an annual basis, they do account for approximately 60 percent of the capital financing for environmental infrastructures, such as loan or grant programs. State and local governments have great flexibility in structuring bonds to meet specific needs.

Since most governmental bonds are tax-exempt, bondholders are generally willing to accept a correspondingly lower rate of return on their investment than they would expect on a comparable commercial bond, and thus provide state governments with low-interest capital.

There are many types of bonds used to finance environmental programs. Three that are most relevant to lead poisoning prevention include the following:
Financial Assistance to Owners

A five-year forgivable loan is offered for the first $5,000 worth of work, with additional amounts of up to $15,000 per unit available through a deferred loan. Loan amounts in excess of $5,000 are repaid at the time of sale or transfer of the property.

Federal Resources to Finance State Programs

The federal government has several funding mechanisms for states to use to administer and enforce lead poisoning prevention programs. Title X requires EPA or any authorized state to impose fees on persons operating accredited training programs and contractors certified to perform lead-based paint activities (see previous section).

Congress also authorized EPA under Title X to provide grants to states to develop and administer authorized programs. The Department of Housing and Urban Development (HUD) distributed $44.4 million in grants to state and local governments in 1992 for lead-based paint abatement programs. Congress appropriated another $90 million for 1993 and authorized $150 million in 1994 for states and local governments to remediate lead-based paint hazards in moderate- and low-income housing. The governments receiving the grants in 1992 pledged an additional $95 million to abate a total of 5,783 units of privately owned housing.

Grantees receiving the funds have either established or promised to establish a state certification program within one year of receiving the grant. Grantees also must demonstrate a capability to identify housing with lead hazards and to oversee the conduct of the abatement work.

Other HUD grant programs include the Community Development Block Grant.
(CDBG), Public Housing Operating Subsidies, and the HOME program of the National Affordable Housing Act of 1990.

CDBG allocates funds to cities and urban counties with populations over 50,000. Recipient governments may use a portion of their funding for administration. Grantees may spend their funds for a wide variety of activities, including physical improvements to neighborhoods, economic development, public works construction, code enforcement, and housing rehabilitation.114

At least 75 percent of a recipient’s residential rehabilitation activities must benefit low- and moderate-income households, and the recipient may grant or loan CDBG funds to private households, neighborhood-based organizations, or investors in housing who carry out eligible activities, which includes lead-based paint abatement if written into the administrative plan. CDBG recipients have used these funds to provide abatement grants and loans and to purchase lead paint testing equipment.

HUD’s HOME program provides block grants to states and local governments that encourage the design and implementation of housing programs tailored to local needs. The program specifically promotes housing rehabilitation and replaces several other rehabilitation programs, including Section 312 and the rental rehabilitation program. Funding lead-based paint abatement activities is likely since abatement can be most efficiently and economically done during rehabilitation. Congress authorized $2.086 billion in 1992 for this program.117

The Department of Health and Human Services (HHS) also provides grants to states, but for screening and health-related programs solely. HHS’s categorical grant program of Grants to States for Childhood Lead Poisoning Prevention funds primarily screening to identify children with elevated blood lead levels, but also provides information on the extent of lead poisoning within specific communities.118

HUD’s Office of Public Housing, Assisted Housing, which oversees public housing operation and financial management, provides operating subsidies to public housing authorities to fund any differences between allowed and statutorily restricted rents. The subsidy is determined by previous year’s operating costs and other adjustment factors. Congress usually appropriates $2 billion per year for the program.115

Public housing authorities may use operating reserves to finance lead-based paint testing and abatement, but such funds may be restricted to emergency situations because of their limited availability. Operating funds, however, could be used for small-scale activities to reduce lead-based paint hazards, such as lead dust cleanup, removal of minor lead-based painted surfaces, or temporary relocation of families. Some money may be used for resident education programs as a tenant service expenditure.116

HHS’s Maternal and Child Health Block Grant, the State Preventative Health and Health Services Block Grant, and Grants for Community Health Centers may be used to fund state screening programs. The Maternal and Child Health grant provides funds to each state for a broad range of health services, including preventive and primary care for children. States and cities may use funds available to them for screening for lead poisoning and other prevention activities if it is an important health problem in their communities. Some states use the preventative health and health service grant for lead screening activities. The community health centers grant can also be used to fund lead poisoning prevention activities; it provides essential health care services to underserved populations, including low-income, inner city households whose children are most at risk of lead poisoning.119
APPENDIX A: Federal Statutes

Lead-Based Paint Poisoning Prevention Act, 42 U.S.C. 4822 (1971)

The passage of the Lead-Based Paint Poisoning Prevention Act (LPPPA) marked the first federal effort to identify lead-poisoned children and reduce environmental exposure from lead. The act initiated programs to screen children and begin the elimination of lead-based paint in residential housing.

LPPPA directed the Department of Health and Human Services to:

- Prohibit the use of lead-based paint in residential structures constructed or rehabilitated by the federal government or with federal assistance in any form
- Establish a national program to encourage and assist states and cities to conduct mass screenings
- Identify children with elevated blood lead levels and make sure they receive medical treatment
- Investigate the child’s residences for sources of lead
- Order abatement of the residences if necessary

The Centers for Disease Control and Prevention administered the program from its inception until 1981, when the program was incorporated into Maternal and Child Health Services Block Grant. Under the grant, states may use these funds for childhood lead poisoning prevention, but they are not required to.

LPPPA defined lead-based paint as “paint containing more than 1 percent lead by weight”; this was amended in 1976 to 0.06 percent lead by weight, which remains the standard today. However, there is no universal definition of lead-based paint.

The Department of Housing and Urban Development (HUD), responding to the LPPPA, promulgated regulations prohibiting the use of lead-based paint in HUD-assisted housing. The 1973 amendments to the act required that HUD eliminate lead-based paint poisoning hazards in housing built before 1950 (later amended to pre-1978 housing) covered by housing subsidies and applications for mortgage insurance and in all federally owned housing prior to sale.

Congress amended the LPPPA again in 1988 to direct HUD to change its lead-based paint requirements for public housing to include “intact paint” in its definition of immediate hazards. Congress also directed HUD to begin an extensive research and demonstration program that provided the data for more extensive programs to eliminate or reduce lead in residential housing. The reports produced from this research covered testing technology for detecting lead-based paint; an estimate of the hazards from lead-based paint based on region, amount, and paint characteristics; a lead-based paint abatement demonstration project; and an in-place management or interim containment program.

Lead Contamination Control Act of 1988, 42 U.S.C. 201

The Lead Contamination Control Act (LCCA) authorized CDC to provide grants to states to administer a program for preventing childhood lead poisoning for fiscal years 1990 and 1991. Under this grant money, states were to:

- Screen infants and children for lead
- Refer cases of elevated blood lead levels to the state for treatment and provide environmental case management
- Provide for education to communities with the highest risk for EBL (above 25 µg/ dL)
LCCA also addressed lead in drinking water (42 U.S.C. 300j-21 et. seq.). States were to establish programs to test and eliminate lead in water from schools and day care centers by July 1989 and provide for public notification of drinking water analyses. EPA distributed grants to states to assist local education agencies in meeting the requirements of the act.


Congress passed the most comprehensive federal lead poisoning prevention legislation in 1992 as part of the Housing and Community Development Act. The act, entitled the Residential Lead-Based Paint Hazard Reduction Act, better known as Title X, redefines the federal response to lead poisoning by directing several federal agencies to establish a coordinated effort to reduce lead hazards. The main agencies responsible for Title X are the Department of Housing and Urban Development (HUD), the Environmental Protection Agency (EPA), and the Department of Labor.

**HUD requirements.** Title X expands HUD’s coverage of federally owned and assisted housing subject to lead-based paint reduction activities. All public housing built before 1978 must be inspected, and housing built before 1960 must be abated of all lead-based paint. Housing under the Resolution Trust Corporation, Federal Insurance Deposit Corporation, Department of Defense, and Indian Housing are subject to Title X’s inspection and abatement requirements upon sale. States and local governments must evaluate and propose how to integrate lead-based paint hazards reduction into their housing policies and programs. HUD must also issue guidelines for the conduct of federally supported risk assessments, inspections, interim controls, and abatement of lead-based paint hazards.

Title X imposes disclosure requirements on persons selling or leasing target housing with lead-based paint hazards. Besides disclosure, sellers or lessors must provide a pamphlet on lead hazards (produced by EPA) and allow risk assessment or inspection for the presence of lead-based paint hazards.

More important to states, Title X authorizes HUD to distribute close to $400 million in grants to states and local governments to reduce lead based paint hazards in priority housing that is not federally assisted or owned property. Funding under Title X is available for states to establish training, certification, and accreditation programs to meet the requirements of Section 402.

Subtitle D of Title X requires HUD to conduct research on strategies to reduce the risk of lead exposure from other sources, including exterior soil and interior lead dust in carpets, furniture, and forced-air ducts. Subtitle E requires HUD to submit to Congress an annual report assessing the progress in implementing the programs authorized by Title X.

**EPA requirements (TSCA Title IV): Lead exposure reduction.** Title X amends the Toxic Substance Control Act (TSCA) by adding a fourth title: Lead Exposure Reduction. TSCA gives EPA the authority to address lead in residential housing, public and commercial buildings, and steel structures.

Under this title EPA must promulgate regulations ensuring that “individuals engaged (in lead-based paint activities) are properly trained, that training programs are accredited, and that contractors engaged in such activities are certified.” EPA also must develop standards for reducing lead hazards, taking into account reliability, effectiveness, and safety, and require that all “risk assessment, inspection, and abatement activities in
target housing (housing built before 1978)... be done by certified contractors.” Certification also applies to persons who identify lead-based paint, remove or abate lead, or do demolitions on any commercial building or public building built before 1978, on any bridge, or on any other structure or superstructure.

States seeking to administer and enforce their own training, certification, and accreditation programs may apply for authorization from EPA. Title X requires EPA to approve a state program if it is “at least as protective of human health and the environment as the Federal program” and “such state provides adequate enforcement.” To assist states in adopting such programs, EPA must develop a model state program. The program is intended to facilitate states in developing their programs by using existing state certification and accreditation programs while encouraging reciprocity among all states. Any state without an authorized program two years after the promulgation of these regulations will be subject to an EPA-administered and -enforced program.

Renovation and remodeling activities in target housing and public and commercial buildings will be regulated to reduce the risk of exposure from lead-based paint, and studies will be done to determine whether persons engaged in various renovation and remodeling activities significantly contribute to elevated blood lead levels and should be certified. Persons performing renovation work in target housing must provide to the owner and occupant of that housing an EPA-produced pamphlet about lead hazards.

EPA will determine dangerous levels of lead in paints, soil, and dust to be used as health-based standards for Title X activities. EPA must also sponsor public education and outreach activities, develop practical consumer information for retail distribution on hazards of renovation and remodeling, and establish a national clearinghouse on childhood lead poisoning. It will also publish a lead hazard information pamphlet.

**U.S. Department of Labor.** The U.S. Department of Labor focuses on worker protection. By April 1994 the department must issue interim final regulations regulating occupational exposure to lead in the construction industry. The department also must coordinate between EPA and OSHA for enforcement and make grants for training and education of workers and supervisors.
APPENDIX B: State Statutes Regarding Prevention of Lead-Based Paint Poisoning

Arizona

1. Lead-Based Paint


Prohibits certain uses of lead-based paint and authorizes the department of health to develop and conduct programs to prevent, detect, and treat lead-based paint poisoning.

Arkansas

1. Lead Poisoning Prevention


Provides for the prevention, screening, diagnosis, and treatment of lead poisoning including elimination of the sources of the poisoning through research, education, epidemiological, and clinical activities.


Adopts a training, certification, and accreditation program for lead abatement work.

California

1. Childhood Lead Poisoning Prevention Act


Establishes the Childhood Lead Poisoning Prevention Program within the Department of Health Services and requires them to compile information, identify target areas, and analyze information to design and implement a program of medical follow-up and environmental abatement to reduce childhood lead exposure.

2. Childhood Lead Poisoning Prevention Act


Provides that housing authorities acting in good faith will not be liable for any injury caused by the presence of LBP prior to Jan. 1, 1989.

3. Disclosure Requirements

Cal. Civ. Code § 1102.6; § 2079.7 (West Supp. 1992)

Requires the disclosure upon sale of a property any lead based paint that may be a hazard.

4. Lead-Safe Schools Protection Act

Cal. Educ. § 32230 to 32245 (West Supp. 1992)

Provides for a sample survey to predict lead contamination in public schools and determines response.

5. Occupational safety and health: lead related construction work.

Cal. Health and Safety Code 429.13 to 429.15

Instructs California Department of Health Services to develop a program that will comply with the Residential Lead-Based Paint Hazard Reduction Act of 1992 and to promulgate regulations to establish an authorized state program pursuant to TSCA Title IV.

Connecticut

1. Financial assistance for removal of lead-based paint and asbestos


Provides for loans up to two-thirds of the cost
of the abatement to persons seeking to remove lead-based paint.

2. Testing for elevated blood lead levels

\texttt{CONN. GEN. STAT. ANN. \S 10-206; 10-206b (West 1989)}

Demands the local or regional boards of education to require each pupil to have a health assessment that may include testing for elevated blood lead levels.

3. Department designated as lead agency for child day care facilities

\texttt{CONN. GEN. STAT. ANN. \S 17-585 (West Supp. 1991)}

Designates the Department of Human Resources as the lead agency for day care centers. Requires the department to inspect day care centers for any evident sources of lead poisoning prior to their being registered with the state.


\texttt{CONN. GEN. STAT. ANN. \S 19a-110 and \S 19a-11a, b, c, and d (West Supp. 1990)}

Requires physicians and private labs to report to the commissioner of health services people with lead levels of .025 milligrams per 100 grams of blood or more.

Upon receipt of report, commissioner shall investigate the source of the lead and report the results to the local building officials. Local building officials will require action be taken by the persons responsible for the condition and, if necessary, relocate the occupants of the building.

The statute also provides for the establishment of a lead poisoning prevention program, an education and early diagnosis program, provisions for the removal of lead-based paint, and it directs the commissioner to establish certification criteria and procedures for lead inspectors and lead abatement and removal contractors.

5. Use of paint in tenements and municipally owned buildings

\texttt{CONN. GEN. STAT. ANN. 21a-82 (West 1985)}

Prohibits the use of lead-based paint in tenements or municipally-owned buildings unless it is done in compliance with state and federal LBP guidelines.

6. Paint not conforming to standards renders property unfit

\texttt{CONN. GEN. STAT. ANN. \S 47a-8 (West Supp. 1991)}

Mandates a property being deemed unfit if paint does not conform with federal standards or is cracked, chipped, blistered, flaking, loose, or peeling if property is intended for human habitation.

**Delaware**

1. Restrictions on lead based paint

\texttt{DEL. CODE ANN. tit. 31 \S 4114 (Michie 1985)}

Prohibits the use of paint with more than 0.5 percent lead on any surfaces of a dwelling or dwelling unit, including fences and outbuildings.

**Georgia**

1. Lead Poisoning Prevention

\texttt{GA. CODE ANN. 31-40-1 (1994)}

Provides for the promulgation of regulations regarding training, licensing, and certification of individuals performing lead hazard reduction activities; sets standards for performing such activities; provides for reciprocity; and provides for fees, among other purposes.
Illinois

1. Lead Poisoning Prevention Act  
ILL. ANN. STAT. ch. 111 1/2 p. 1301 to 1308.2  
(Smith-Hurd 1980)

Provides for the establishment of a lead poisoning prevention program encompassing screening, reporting, lab analysis, licensure of inspectors, inspection, and abatement requirements under the Department of Public Health and directs the department to perform these and other activities. The statute also prohibits or regulates the use of lead-bearing substances.

Iowa

1. Lead Abatement Program  
IOWA CODE § 135.100 to 105 (West 1989)

Establishes a lead abatement program within the Department of Public Health. The statute requires the department to implement and review programs designed to eliminate or reduce dangerous levels of lead in children.

Kentucky

1. Lead Poisoning Prevention  
KY. REV. STAT. ANN. § 211.900 to 211.905  
(Michie 1982, Supp. 1990)

Provides the authority for the secretary for human resources to establish a lead poisoning prevention program, including the screening, diagnosis, and treatment of lead poisoning.

Louisiana

1. Lead paint poisoning prevention and control act  
LA. REV. STAT. ANN. § 40:1299:26 to 40:1299:29  
(West Supp. 1990)

This act establishes a comprehensive lead poisoning control program and encompasses the sale and use of lead-based paint, the removal or repainting of surfaces that have lead based paint, and the enforcement of such provisions.

2. Lead Hazard Reduction, Licensure and Certification  

This bill amends Chapter 15-A of Title 30 to provide for lead hazard reduction. Included in the bill is licensure and certification requirements for lead abatement and inspection professionals, abatement provisions, authority to promulgate regulations relating to lead hazard reduction, and funding for such programs.

Maine

1. Lead Poisoning Control Act  
ME. REV. STAT. ANN. tit. 22 § 1314 to 1326  
(West 1980 and Supp. 1990)

Enacts a lead poisoning control program that encompasses the restriction of sale and use of lead-based products, an early diagnosis program, educational outreach, reporting requirements, inspections by public health officials, notice to remove hazards, enforcement provisions, licensure of inspectors and abaters, and certification of training programs and labs; also grants the Department of Human Services the authority to implement these activities.

Maryland

1. Lead-based paint  
MD. ENV. CODE ANN. § 6-301 to 6-303 and 6-601 to 6-608; 6-1001 to 1-1005 (Michie 1994)

Prohibits the use of lead-based paint on any interior surface, on any exterior surface commonly accessible to children, or any article that is intended for household use.
The act also requires physicians to report persons with elevated blood lead levels and creates an advisory council to explore the problem of lead poisoning.

Provides for the accreditation of training providers and the certification and licensure of lead abatement professionals.

2. Reduction of Lead Risk in Housing

**MD. ENV. CODE ANN. § 6-801 to 6-852 (Michie 1994)**

Establishes risk reduction standards for affected properties; requires owners of affected properties to register those properties and perform risk reduction activities. Provides for immunity from liability under certain circumstances, specifies insurance requirements for certain insurors and owners, includes other provisions.

3. Failure of lessor to remove lead-based paint; rent escrow

**MD. REAL PROP. CODE ANN. § 8-211.1 (Michie 1988)**

Provides for a lessee of a rental property which the lessor has failed to remove lead-based paint within 20 days of notice to deposit rent with the District Court where it will be held until the lessor has remedied the situation. The tenant may not be evicted or be subject to an increase in rent for exercising this remedy.

**Massachusetts**

1. Lead Poisoning Prevention and Control

**MASS. GEN. L. ch. 111 § 190 to 199A (West 1990, West Supp. 1993)**

Establishes a comprehensive lead poisoning prevention program. The act directs the program to promulgate regulations regarding universal screening of children under six years, guidelines for medical follow-up, and procedures for reporting elevated blood levels. The act also provides for an educational and publicity program to inform the general public, the establishment of a lead poisoning laboratory, and disclosure of lead hazards upon sale of a property.

The act grants authority to the department of health to require the inspection and abatement of residences and require the licensing of inspectors and deleaders (abaters).

2. Lead Removal Assistance Program

**MASS. GEN. L. CH. 23B § 28 (WEST SUPP. 1993)**

Establishes a grant and loan program to assist residential property owners in financing lead abatements.

**Minnesota**

1. Lead abatement and standards

**MINN. STAT. § 144.871 to 144.878 (1990)**

Provides for a task force to evaluate costs of providing assistance for abatement programs; provides for education, reporting requirements, abatement procedures, relocation of residents, residential lead assessment guide, registration of abatement contractors, and regulations to carry out these provisions.

**Missouri**

1. Lead Poisoning Prevention

**MO. STAT. ANN. 701.300 et seq. (West 1994)**

Provides for the establishment of a lead poisoning prevention program and commission. The department of health will set standards for blood lead levels, residential abatement, inspections, and training; provide for the licensure and accreditation lead abatement and inspection professionals; and establishes enforcement authority. The act also provides for educational and outreach programs.
New Hampshire

1. Lead paint poisoning prevention
N.H. REV. STAT. ANN. § 130-A:1 to 130 A:17 (West 1990)

Provides for inspections, notice and removal; prohibits certain acts; and grants authority to the director of public health to promulgate regulations regarding lead poisoning prevention. Authorizes the Division of Public Health Services the authority to license lead abatement training providers, contractors, workers, supervisors, inspectors, and risk assessors. The statute also covers state-ordered abatements, relocation of tenants, reciprocity with other states, and funding to cover the costs of the program.

The law applies to landlords, day care centers, and rental property owners. Persons with four or fewer dwelling units are exempt from licensing but must take the training and follow rules for abatement.

New Jersey

1. Lead poisoning prevention
N.J. REV. STAT. ANN. § 26:2-130 to 26:2-137 (West 1992)

Promulgates regulations for lead poisoning prevention through the Administrative Procedures Act. The statute requires the commissioner of the department of health to promulgate regulations to identify sources of lead within dwellings; to establish testing procedures to detect lead in persons; to stimulate professional and public education concerning the need to test, detect, and control lead poisoning; and to abate identified lead hazards.

2. Paint containing lead

Prohibits the use of LBP on certain products, and on the interior or exterior of any building readily accessible by children; provides for abatement procedures, notification; and enforcement penalties.

New York

1. Control of lead poisoning
N.Y. PUB. HEALTH LAW § 1370 to 1376-a (McKinney 1971 and Supp. 1990)

Provides for the prohibition of sale of certain products containing lead-based paint, the abatement of lead poisoning conditions, and the enforcement for these rules and regulations.

North Carolina

1. Lead Poisoning in Children
N.C. GEN. STAT. 130A-131.5 (Michie 1992)

Requires the Commission of Health Services to adopt rules for the prevention and control of lead poisoning in children. Laboratories must report elevated blood lead levels of children under six years; the department must determine a maximum standard for elevated levels of blood lead; and the department must conduct investigations to determine the sources of elevated blood lead levels.

Ohio

1. Childhood Lead Poisoning Prevention

Provides for the licensure of an individual performing lead abatement work; the approval of environmental lead laboratories; directs the implementation of a lead poisoning prevention program; and to create the Lead Program Fund; among other purposes.
Rhode Island

1. Lead Poisoning Prevention Act

Expands the childhood lead screening and diagnosis program, and the environmental management and primary prevention program, and provides mechanisms for funding.

2. General requirements relating to the safe and sanitary maintenance of parts of dwellings and dwelling units relative to lead-based paint.

Prohibits the use of lead based paint in dwellings with surfaces accessible to children under six years, and provides for inspection and abatement procedures for emergency situations. Specifics of the statute include a definition of “lead-based substance” as materials containing lead in excess of 0.5 percent of lead by weight and provisions for emergency abatements if child occupying the property is suffering lead poisoning.

South Carolina

1. Lead Poisoning Prevention and Control Act

Comprehensive act that prohibits the use of lead in certain items, requires reporting of lead poisoning followed by an inspection, and specifies notification procedures for informing owners/occupants of lead hazards.

Vermont

1. Childhood Lead Poisoning, Screening, and Lead Abatement Act
38 V.S.A. § 1751 - 1757 (1993)

This act establishes a training and certification program for lead hazard abatement workers within the Department of Health. The act also provides for blood lead screening upon request, inspection and testing for child care facilities, and disclosure of lead-based hazards prior to sale or lease of housing built before 1978.

Virginia

1. Asbestos and Lead Contractors and Workers

Relates to certification of lead contractors, professionals, and workers. Provides that lead hazard reduction activities meet the requirements of the federal program. A program will be implemented by January 1, 1995.

Wisconsin

1. Lead Poisoning Prevention
Wis. Stat § 151.01. to 151.13. (West 1989)

Comprehensive act relating to lead poisoning prevention. Prohibits certain uses of lead; provides for reporting requirements, inspection; and abatement procedures; grants authority to the Department of Health and Social Services; to perform screening and medical case management, adopt inspection and risk assessment requirements, abatement standards, training and licensure requirements, and provide for enforcement of these provisions.
APPENDIX C: Resources for Further Information

FEDERAL RESOURCES

Department of Housing and Urban Development (HUD)
Office of Lead-Based Paint Abatement and Poisoning Prevention
202/755-1810
451 7th Street, S.W.
Washington, D.C. 20410

Centers for Disease Control and Prevention (CDC)
Lead Poisoning Prevention Branch
404/488-7330
4770 Buford Highway, N.E.
Building 101, Mail Stop 742
Atlanta, Georgia 30341

Environmental Protection Agency
Office of Pollution Prevention and Toxics
202/554-1404
401 M Street, S.W.
Washington, D.C. 20460

Office of Drinking Water
800/426-4791
401 M Street, S.W.
Washington, D.C. 20460

OTHER RESOURCES

Alliance to End Childhood Lead Poisoning
202/543-1147
227 Massachusetts Avenue, N.E.
Suite 200
Washington, D.C. 20002

Association of State and Territorial Health Officials
202/546-5400
415 Second Street, N.E.
Suite 200
Washington, D.C. 20002

Conservation Law Foundation
617/350-0990
62 Summer Street
Boston, Massachusetts 02110

Environmental Defense Fund
202/387-3500
1875 Connecticut Avenue, N.W.
Suite 1016
Washington, D.C. 20009

National Center for Lead-Safe Housing
410/992-0712
205 American City Building
Columbia, Maryland 21044

National Conference of State Legislatures
303/830-2200
Lead Hazards Project
1560 Broadway, Suite 700
Denver, Colorado 80202

National Lead Information Center
1019 19th Street, N.W.
Suite 401
Washington, D.C. 20036

Lead Hotline
800/LEAD-FYI

Clearinghouse
800/424-LEAD

HUD User
800/245-2691
P.O. Box 6091
301/251-5154
Rockville, Maryland 20850

University of Massachusetts at Amherst
413/545-5201

University of Cincinnati
513/558-1730

University of Maryland at Baltimore
410/706-1849

Georgia Institute of Technology
404/894-3806

University of Kansas
913/897-8500

University of California at San Diego
619/534-6157
NOTES

EXECUTIVE SUMMARY


6. Ibid, p. 36.

7. Ibid, p. 35.

8. Based on information reported to NCSL in a survey of state lead poisoning prevention contacts in March 1994.

9. Information from the NCSL survey of state contacts.


11. HUD, Comprehensive Workable Plan, p. 4-20.

1. NATURE AND EXTENT OF LEAD POISONING


15. Ibid, p. 11.


17. Ibid.


21. In 1978, the federal government, through the Consumer Products Safety Council, banned lead in paints for residential purposes.


25. HUD, Comprehensive Workable Plan, p. 4-4, 4-5.

26. Ibid.

27. Ibid., p. 4-11.

28. Title X defines interim controls as any set of measures designed to reduce temporarily human exposure to lead-based paint hazards, including specialized cleaning, repairs, maintenance, painting, temporary containment, ongoing monitoring of lead-based paint hazards or potential hazards, and the establishment and operation of management and resident education programs.


30. NHANES II survey, 1988. The survey was unable to determine the number of children poisoned from lead in dust and soil.


34. HUD, Comprehensive Workable Plan, p. 6-13.


36. Rhode Island, Maine, Connecticut, Minnesota, and Vermont recommend these policies.
37. HUD, Comprehensive Workable Plan, p. 6-13.
38. 56 Federal Register 26460, 26463 (June 7, 1991); EPA, Strategy for Reducing Lead Exposure, p. 22.
40. 40 C.F.R. 141.80 to 141.89.

2. STATE ROLE IN REDUCING LEAD EXPOSURES

43. In 1978, the federal government, through the Consumer Product Safety Commission, banned the addition of lead to new residential paint. CDC, Preventing Lead Poisoning in Young Children, p. 3.
44. HUD, Comprehensive Workable Plan, p. 5-12.
47. Residential Lead-Based Paint Hazard Reduction Act of 1992 (Public Law 102-550)
49. Section 1014 of Title X.
50. Section 1011 of Title X.
51. HUD, NOFA for Lead-Based Paint Hazard Reduction in Priority Housing, 58 FR 31847, 31866 (June 4, 1993).
52. CDC recommends a multiterritorial approach for lead poisoning prevention programs. For blood lead levels of 10 ìg/dL or greater, community prevention activities should begin. At levels above 20 ìg/dL, medical evaluation and environmental investigations should be done. At levels above 15 ìg/dL, children should receive individual medical management, including nutritional and educational interventions and more frequent screening. If resources are available, environmental investigations and remediations should be done if a child’s blood lead level remains at 15 ìg/dL to 19 ìg/dL. Children with the highest blood lead levels should receive the highest priority. CDC, Preventing Lead Poisoning in Young Children, p. 2.
54. CDC, Preventing Lead Poisoning in Young Children, p. 76, 77.
55. CDC, Preventing Lead Poisoning in Young Children, p. 76.
57. CDC, Preventing Lead Poisoning in Young Children, p. 76.
58. CDC, Preventing Lead Poisoning in Young Children, p. 4.
59. According to estimates given to the Association of State and Territorial Public Health Laboratory Directors at their October 1991 meeting.
60. CDC, Preventing Lead Poisoning in Young Children, p. 2.
61. Ibid.
62. Lead Poisoning Prevention and Control, MASS. GEN. LAWS ANN. Ch. 111 s. 190.
64. Public outreach is practiced in 41 states. For more information see HUD, Comprehensive and Workable Plan, p. 5-2; CDC, Preventing Lead Poisoning in Young Children, p. 78, 79.
65. Title X sec. 406.
66. CDC, Preventing Lead Poisoning in Young Children, p. 78.
67. Recommendations offered by CDC to reduce lead levels include: Making sure that children do not have access to peeling paint or chewable surfaces painted with lead-based paint; paying special attention to windows, window sills, and wells; wet mopping houses built before 1960 with hard surface floors once a week with a high phosphate solution (other hard surfaces, such as window sills and baseboards should be wiped); washing children’s hands and face and their toys and pacifiers frequently; planting grass or shrubs over open soil if near house with exterior lead-based paint; flushing water for drinking and cooking in areas where the lead content in water exceeds the drinking water standards; making sure that take-home exposures are not occurring from parental occupations or hobbies. CDC, Preventing Lead Poisoning in Young Children, p. 30-31.
68. CDC, Preventing Lead Poisoning in Young Children, p. 66-67.
69. CDC, Preventing Lead Poisoning in Young Children, p. 67.
70. Title X, Section 401(16).
72. Title X requires EPA to promulgate abatement standards.
73. Title X, Section 404(h).

3. TRAINING, CERTIFICATION AND ACCREDITATION

74. Title X, Section 404(h).
75. HUD, Comprehensive and Workable Plan, p. 6-14.
76. Title X, Section 402.
77. The five centers are based at the following universities: University of Massachusetts at Amherst; University of Maryland and University of Cincinnati (joint program); Georgia Institute of Technology; University of Kansas; University of California at San Diego.
78. Lead-Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing, 55 Federal Register 14556, 14581 (April 18, 1990).
79. Ibid, 14582.
80. HUD awarded $44 million for lead-based paint abatement programs in 1992 to California, Massachusetts, Minnesota, New Jersey, Rhode Island, and Wisconsin; the cities of Baltimore, Boston, and Cleveland; and Alameda County, California. For 1993, HUD awarded $91 million to Maryland, Michigan, North Carolina, Ohio, Pennsylvania, Vermont, and Virginia; the cities of Chicago, Cincinnati, New Haven, New York City, Philadelphia, San Francisco, Springfield, Mass.; and the counties of Allegheny, Pa., Los Angeles, Calif., Prince George, Md., and Shelby County, Tenn.
82. Ibid.
84. Title X, section 402 (a)(2).
85. Title X, section 402 (b)(2).
86. States may adopt the implementing regulations of 402. Title X, section 404. For more information see 138 Congressional Record H11465 to H11476 (daily ed. October 5, 1992).
87. Section 404 (b)(1)(2) of Title X.
88. Section 404 of Title X.
89. See 138 Congressional Record H11465 to H11476 (daily ed. October 5, 1992).
90. Based on conversations with state and federal administrators during meetings held to discuss implementation of Title X. These meetings, part of the Forum on State and Tribal Toxics Action, have brought together staff from EPA’s Office of Pesticides, Prevention, and Toxic Substances and state agency and legislative personnel to discuss common problems regarding lead poisoning prevention.
91. 55 Federal Register 14582.
92. Title X, Section 408.
93. Title X, Section 402(c)(1).
94. Title X, section 402(a)(3).

4. FUNDING OPTIONS FOR STATE LEAD POISONING PREVENTION PROGRAMS

96. HUD, Comprehensive and Workable Plan, p. 4-11, 4-22.
98. States generally use alternative funding mechanisms to support most of their environmental programs. For more information see U.S. Environmental Protection Agency, State Capacity Task Force, A Compendium of Alternative Financing Mechanisms for Environmental Programs, (Washington, D.C., July 1992).
103. For more information see Alliance to End Childhood Lead Poisoning, Resource Guide for


106. Ibid, p. 5.


109. For more information see EPA, A Compendium of Alternative Financing Mechanisms for Environmental Programs, pp. 62-70.

110. For more information see EPA, A Compendium of Alternative Financing Mechanisms for Environmental Programs, pp. 62-70.

111. Title X, section 402(a)(3).

112. Title X, section 404(g).


114. HUD, Comprehensive and Workable Plan, p. 6-18.


116. For more information see the Alliance’s Resource Guide and Comprehensive and Workable Plan, p. 6-17 to 6-22.

117. HUD, Comprehensive and Workable Plan, p. 6-20

118. IBID, p. 6-20.

119. IBID, p. 6-19.

5. APPENDIXES

120. For more information see Comprehensive and Workable Plan, p. 1-3.

121. Title X, sec. 1011(g)(1).

122. Title X, sec. 402.

123. Title X, sec. 402.

124. Title X, sec. 402(b)(1)(2).
### ACRONYMS AND ABBREVIATIONS

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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ATSDR</td>
<td>Agency for Toxic Substances and Disease Registry</td>
<td>HUD</td>
<td>U.S. Department of Housing and Urban Development</td>
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<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
<td>LBP</td>
<td>Lead-Based Paint</td>
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<td>CERCLA</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Act</td>
<td>LPPA</td>
<td>Lead-Based Paint Poisoning Prevention Act</td>
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<td>CHAS</td>
<td>Comprehensive Housing Affordability Strategy</td>
<td>LCCA</td>
<td>Lead Contamination Control Act</td>
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<td>EBL</td>
<td>Elevated Blood Lead</td>
<td>NIOSH</td>
<td>National Institute for Occupational Safety and Health</td>
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<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
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<td>EPSDT</td>
<td>Early and Periodic Screening, Diagnostic, and Treatment Program</td>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
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<td>TC</td>
<td>Toxicity Characteristic Test</td>
<td>TSCA</td>
<td>Toxic Substances Control Act</td>
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<tr>
<td>µg/dL</td>
<td>microgram of lead per deciliter of blood</td>
<td>µg/kg</td>
<td>milligrams of lead per kilogram of soil</td>
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BIBLIOGRAPHY


A detailed proposal is summarized to make private U.S. housing units lead-safe. Specific requirements for property owners, a workable schedule, and mechanisms that reinforce and reward responsible action are discussed (47 pages).


Examines state Medicaid policies, providing a status report on state conformity, current practices, recommendations and Medicaid program polices. Contains recommendations for key policy changes at the national and state levels to maximize Medicaid's contribution to preventing childhood poisoning (87 pages).


Provides specific recommendations for federal, state, and local governments to reduce children's exposure to lead (62 pages).


Provides a summary and analysis of Title X’s changes, its impact, and its implications (19 pages).


Model state legislation designed to mandate a comprehensive childhood lead poisoning prevention program at the state, and local levels. Includes annotations and “talking points” (100 pages).


Summarizes the findings of the June 1992 lead prevention survey conducted by the Association of State and Territorial Health Officials (ASTHO) in regards to the implementation of the recommendations made in the revised 1991 CDC Childhood Lead Poisoning Prevention Policy Statement (i.e., screening, funding, and follow-up of children with elevated blood lead levels) (2 pages).


Presents the results of Phase 1 of the Third National Health and Nutrition Examination Survey.


Profiles state programs to reduce lead hazards, provides brief descriptions of the specific activities, and lists the people who administer them (141 pages).

Presents a public policy report and proposal for legislative action. Contains tables with estimates of local prevalence of childhood lead poisoning in this country (46 pages).


Reviews seven states’ attempts to implement recommendations made in the CDC’s 1991 policy statement “Preventing Lead Poisoning in Young Children” (46 pages).


Report prepared by the National Research Council’s Committee on Measuring Lead Exposure in Critical Populations. The committee concurred with CDC’s selection of 10 µg/dL as the lead concentration of concern.


Reports on state lead prevention programs and abatement measures required and on strategies for lead hazard reduction in both the public and private sectors (102 pages).


This technical assistance bulletin was developed in close consultation with HUD to enable people who are unfamiliar with lead-based paint issues to integrate lead into the development of their Comprehensive Housing Affordability Strategy.


Study to determine the association between lead exposure and intellectual performance in children. Examines the impact of changes in blood lead level on the cognitive index of lead-poisoned children (6 pages).


HUD’s comprehensive report to Congress on the problems of lead-based paint hazards in U.S. housing, abatement strategies, and actions undertaken by federal, state, local, and private agencies to reduce and eliminate lead-based paint hazards.


Reports on the study’s findings regarding wastes from lead-based paint abatements. Discusses the situations in which lead-based paint abatement wastes were found hazardous and reports on its conclusions (43 pages).

U.S. Environmental Protection Agency. Office
EPA's comprehensive abatement performance study directed at the identification and abatement of lead-based paint hazards in privately owned and public housing. Discusses research programs conducted in 10 cities to assess the costs of both short- and long-term efficacy of alternative methods of lead-based paint abatement (57 pages).


Presents CDC’s statement on the nature and extent of lead and lead poisoning, recommends actions to remediate sources of lead, provides information on medical treatment of lead poisoning, and discusses public policy actions to reduce lead poisoning (107 pages).


Discusses CDC’s strategy to increase public health awareness of childhood lead poisoning for long-term prevention and elimination of the problem (93 pages).


Provides an comprehensive overview of the problem of lead poisoning in the U.S.; sources of lead in the environment and the means by which humans are at risk; the estimated number of children at risk of lead's toxic effects by race, family income, and urban location; and the contribution of lead-based paints to lead poisoning (495 pages).


Presents HUD’s demonstration program to compare alternative abatement methods, including their costs, effectiveness, and safety, of lead-based paint hazards in HUD-owned, vacant and single-family properties (110 pages).


Presents the interim final rule amending OSHA’s standards for lead exposure in the construction workplace (60 pages).


Study to determine the effectiveness of removing lead-contaminated soil in reducing the blood lead level of urban children with multiple sources of lead exposure (8 pages).
ABOUT THE AUTHOR

Doug Farquhar is a senior policy specialist responsible for the Lead Hazards and Asbestos Hazards Management Projects in the State Issues and Policy Analysis Program at the National Conference of State Legislatures. The projects provide support to state legislatures, their staffs, and state agency personnel regarding lead hazard reduction and asbestos policies, statutes, and regulations and assist the U.S. Environmental Protection Agency in its work with states. While at NCSL he has written State Asbestos Programs, two editions of Lead Poisoning Prevention: Directory of State Contacts, and several reports and articles on state lead and asbestos policies.

Before coming to NCSL, Mr. Farquhar worked in the CERCLA (Superfund) Litigation Section of the Colorado Attorney General’s Office, as a staffer for the Texas House of Representatives, and in the Washington, D.C., office of Colorado Congressman Dan Schaefer.

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