

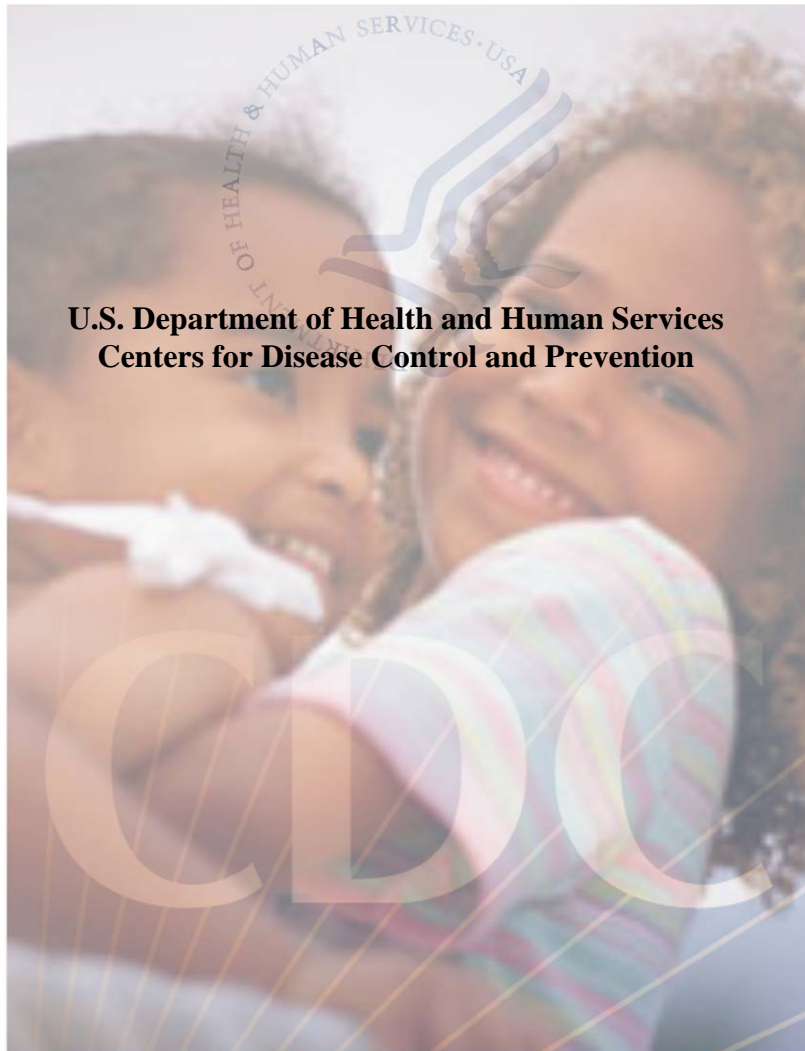
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CDC uses a [blood lead reference value](#) (BLRV) of 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) to identify children with higher levels of lead in their blood compared to most children. This level is based on the 97.5th percentile of the blood lead values among U.S. children ages 1-5 years from the 2015-2016 and 2017-2018 National Health and Nutrition Examination Survey (NHANES) cycles. Children with blood lead levels at or above the BLRV represent those at the top 2.5% with the highest blood lead levels.

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**REPORT TO CONGRESS
FOR FISCAL YEARS 2001–2002**

**CHILDHOOD LEAD POISONING PREVENTION ACTIVITIES
UNDER THE LEAD CONTAMINATION CONTROL ACT OF 1988**



**U.S. Department of Health and Human Services
Centers for Disease Control and Prevention**

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Executive Summary

The Lead Contamination Control Act of 1988 (the Act) authorized the Secretary of the Department of Health and Human Services (HHS), acting through the Centers for Disease Control and Prevention (CDC), to award cooperative agreements to state and local agencies for comprehensive programs designed to prevent childhood lead poisoning. The Act also requires the Secretary to report on the effectiveness of these programs to the House Committee on Commerce and to the Senate Committee on Health, Education, Labor, and Pensions. This report includes information about program activities for fiscal years 2001 and 2002.

Healthy People 2010, the nation's blueprint for action to improve the public's health, calls for elimination of childhood lead poisoning by the end of this decade. The most recent estimates from the 1999–2000 National Health and Nutrition Examination Survey indicate that approximately 434,000 U.S. children younger than 6 years of age had elevated blood lead levels (EBLLs)—i.e., greater than or equal to 10 micrograms per deciliter of (whole) blood ($\mu\text{g}/\text{dL}$).

CDC is mandated to support comprehensive programs to prevent lead poisoning in children. CDC-funded programs are part of an interdisciplinary federal effort encompassing programs administered through HHS, the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA).

CDC-funded state and local childhood lead poisoning prevention programs (CLPPPs) are mandated to

- Screen infants and children for EBLLS;
- Ensure that lead-poisoned infants and children are referred for medical and environmental intervention;
- Educate the public and healthcare providers about childhood lead poisoning; and
- Implement the core public health functions of policy development, program assessment, and quality assurance in relation to lead poisoning prevention.

During fiscal years 2001 and 2002, CDC's Lead Poisoning Prevention Branch directed a total of \$63,385,856 to CLPPPs in state and local jurisdictions. The number of funded CLPPPs increased from 57 in FY 2000 (41 states and 16 local programs, including the District of Columbia) to 62 in FY 2001 (44 states and 18 local programs, including District of Columbia).

Background

Childhood blood lead levels (BLLs) greater than or equal to 10 micrograms per deciliter of (whole) blood ($\mu\text{g}/\text{dL}$) are considered elevated. While lead is toxic to all humans, young children are particularly susceptible. Lead adversely affects many body systems, but its most damaging and insidious effects occur in the developing brain, causing lifelong effects on intelligence, neurobehavioral development, stature, and hearing acuity. BLLs greater than 70 $\mu\text{g}/\text{dL}$ can cause devastating health consequences, including seizures, coma, and death. BLLs as low as 10 $\mu\text{g}/\text{dL}$ have been associated with harmful effects on children's learning and behavior. Recent evidence suggests that there may be effects at even lower levels. Generally, lead poisoning is silent, and few affected children have specific symptoms.

The most common sources of lead exposure for children in the United States are 1) house dust contaminated by deteriorated lead-based paint and 2) soil contaminated by both lead-based paint and decades of industrial and motor vehicle emissions. Lead-based paint was banned from residential use in 1978. Paint with high levels of lead is especially common in pre-1950 housing. Lead poisoning now disproportionately affects racial and ethnic minority children of low-income families living in older, poorly maintained dwellings. In 1991–1994, about 16% of low-income children living in homes built before 1946 had BLLs of 10 $\mu\text{g}/\text{dL}$ or greater. The risk for EBLLs among these children was roughly 30 times greater than that of middle-income and upper-income children living in homes built after lead was removed from house paint. National data show that the risk for EBLLs among African-American children is nearly five times greater than the risk for this condition among white children. The risk is nearly two times higher than for white children among children of Hispanic ethnicity. Results from a 2001 study conducted in two large urban communities characterized by high percentages of racial and ethnic minority residents, poverty, and old housing revealed that 27% of children had EBLLs, more than 12 times higher than the national average.

The financial and technical assistance that the Centers for Disease Control and Prevention (CDC) provides to childhood lead poisoning prevention programs (CLPPPs) through its Lead Poisoning Prevention Branch (LPPB) has traditionally focused on *secondary prevention* of lead poisoning among children. Programs have primarily identified children with EBLLs through screening and have provided services to 1) reduce the lead burdens of the children and 2) eliminate or minimize the long-term health consequences of exposure. These activities and associated funding are crucial for maintaining the often difficult and time-consuming efforts to identify children with EBLLs and to manage their cases appropriately. A critical component of case management is identifying sources of lead in children's environments and reducing lead exposure. Remediation of homes with lead paint hazards protects not only the child and family who currently reside in the home but also families who may move into the home in the future.

With technical assistance and guidance from CDC, state and local programs have continued to shift their efforts from providing direct services (blood lead testing and case management) to the core public health functions of policy development, program assurance, surveillance, and

program assessment in relation to lead poisoning prevention. Cooperative agreements funded by CDC in FY 2000 increased emphasis on these core functions and on *primary prevention* of lead poisoning (i.e., taking measures to protect children from lead exposures) [Table 1].

Fiscal Year	Number of State Programs	Number of Local Programs	Total Number of Programs	Amount
2000	41	16	57	\$30,232,196
2001	44	18	62	\$31,132,274
2002	42	18	60	\$32,253,582

In addition to its programmatic activities, LPPB conducts applied public health research that supports its mission to prevent childhood lead poisoning. During this report period, the branch supported research that

- Studied the effectiveness of new approaches to primary prevention of lead poisoning, approaches that focus on educating at-risk mothers before the birth of their children;
- Focused on analysis of blood collection techniques (capillary vs. venous) among clinicians not participating in a controlled study;
- Identified the need for more clinician training to improve accuracy of test results; and
- Explored the use of geographic information systems (GIS) technology to examine BLLs among children living in old homes of higher value, as compared to focusing on homes of lesser value.

Although substantial reductions in the number of children with EBLLs have continued to occur, significant challenges remain regarding attainment of the *Healthy People 2010* goal to eliminate childhood lead poisoning. House dust contaminated by deteriorated lead-based paint remains the primary source of lead exposure for children in the United States. Lead-based paint hazards primarily affect poor children living in urban neighborhoods—areas that are often also affected by high levels of unemployment, substance abuse, and poverty. The challenges in reaching these communities, though substantial, are far from insurmountable, as illustrated by several public health successes (e.g., high rates of childhood immunization). To prevent another generation of children from being exposed to lead-based paint, it will be imperative that federal agencies and their counterparts at the state and local levels increase collaborations and direct funding to these high-risk communities.

Lead Poisoning Prevention Branch Program Activities, 2001–2002

Primary Prevention

New evidence of adverse health effects in children at blood lead levels at less than 10 µg/dL provides a strong rationale to make primary prevention of lead poisoning a high priority for health, housing, and environmental agencies at the state, local, and federal levels.

Primary prevention is achieved by preventing exposure to infection or other toxic elements. For childhood lead poisoning, this means preventing children from ever being exposed to lead. Efforts aimed at “fixing” residential lead hazards can be both a secondary prevention strategy undertaken after a child has an EBLL and a primary prevention strategy that removes the hazards from the environment of an affected child and also prevents another child from future exposure to the lead hazard.

Another essential element of primary prevention is to restrict or eliminate non-essential uses of lead. Children continue to be poisoned by lead in toys, eating and drinking utensils, cosmetics, and traditional remedies manufactured in the United States or imported. CLPPPs’ efforts are aimed at identifying populations in which the risk of exposure to non-paint sources is high and in developing regulatory and voluntary strategies to control the non-essential use of lead, particularly in articles that are easily accessible to children, in order to prevent exposure.

In 2002, LPPB made a critical decision to place greater emphasis on primary prevention, while also enforcing sound standards of care for children already affected by exposure to lead. To encourage CLPPPs to increase their focus on primary prevention, LPPB awarded 15 CLPPPs with supplemental funding dedicated to primary prevention. Table 2 (on the next page) shows the recipients and the amounts of these supplemental awards for primary prevention.

CLPPP	Supplemental Award
California	\$ 100,000
Detroit MI	\$ 100,000
Duval County FL	\$ 70,148
Hawaii	\$ 57,535
Maryland	\$ 99,453
Massachusetts	\$ 100,000
Missouri	\$ 33,220
Ohio	\$ 100,000
Oklahoma	\$ 69,830
Pennsylvania	\$ 63,720
Philadelphia PA	\$ 99,883
Rhode Island	\$ 100,000
Tennessee	\$ 90,000
Vermont	\$ 79,331
Wisconsin	\$ 100,000
TOTAL	\$1,263,010

Additionally, to enhance CLPPPs’ ability to access resources for primary prevention, LPPB entered into a contract with The Alliance for Healthy Housing formerly the Alliance to End Childhood Lead Poisoning to create a Web-based guide identifying innovative, effective “building blocks” for primary prevention. The information will be gathered from a variety of sources, including CDC program staff, CLPPP managers, other federal agencies, and community-based organizations. Resources will include information regarding innovative financing, market-based incentives, enforcement mechanisms, community-based delivery systems, and tips on how to target high-risk housing and promote lead policy change. The guide will also be available in hard copy. This project is scheduled for completion in 2004.

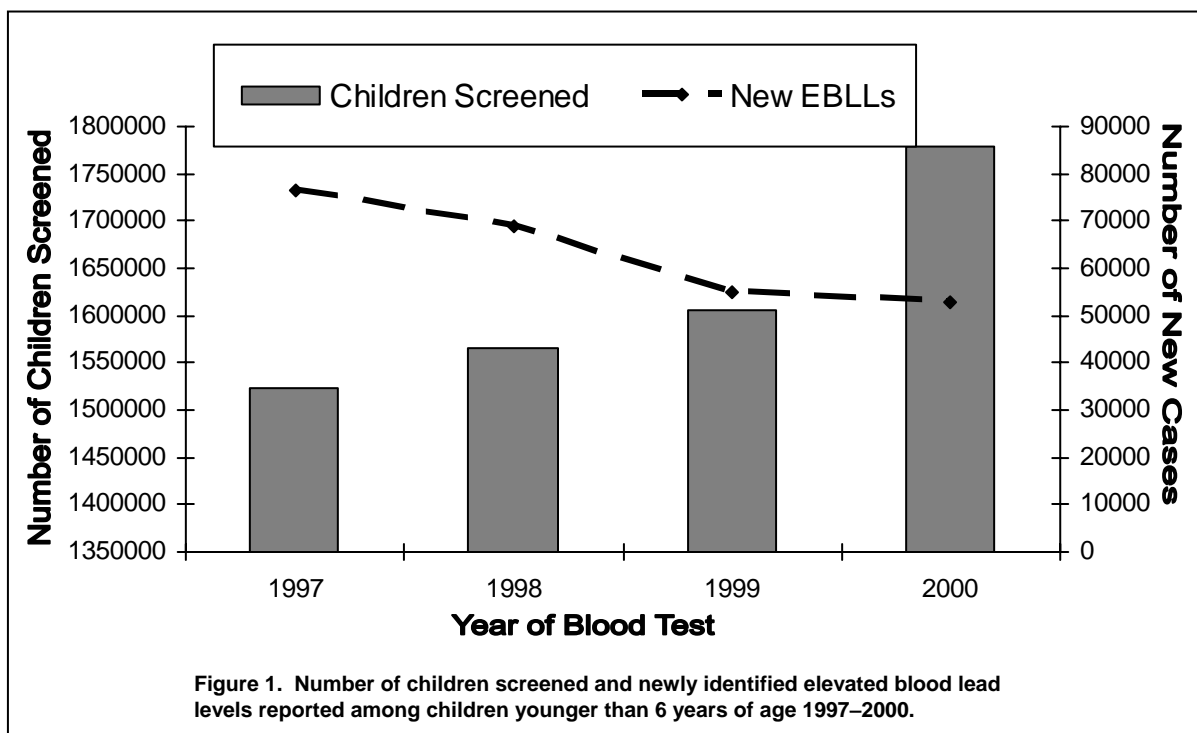
Case Management

A milestone in 2002 was the publication of *Recommendations for the Management of Children with Elevated Blood Lead Levels*. Current case management practices for children with EBLLs vary markedly among states, cities, and jurisdictions. The goal of the new guidance is to improve the quality of the management of children with EBLLs. Written by CDC staff, members of the national Advisory Committee on Childhood Lead Poisoning Prevention, and selected outside experts, the recommendations address (1) assessment and remediation of residential lead exposure, (2) developmental assessment of children, (3) educational interventions for caregivers, (4) nutritional assessment of children, (5) medical assessment of children, and (6) interventions for problems identified in these areas. More than 12,000 hard copies have already been distributed to a wide audience, including state and local health departments, medical practitioners, public health organizations, and the general public.

The National Center for Healthy Housing is working with LPPB to educate state and local program CLPPP managers, supervisors, and case managers about CDC's 2002 case management recommendations and to help them plan how to implement changes in their existing programs to be consistent with those recommendations. Training will be delivered to approximately 300 childhood lead poisoning prevention professionals at eight training sites from June to October 2003. A summary evaluation of problems identified by programs during the training will help CDC when it comes time to revise the recommendations or to provide further assistance to programs.

Screening Children

Figure 1 shows the nearly 20% increase in the number of children younger than 6 years of age screened and reported from 1997 through 2000 (the most recent national data available). The figure also illustrates the nearly 40% decrease in the number of children younger than 6 years of age who were newly identified with EBLLs.



While these and other data indicate that childhood lead poisoning has decreased overall, significant high-risk pockets of lead exposure still exist. LPPB promotes targeted lead screening on the basis of age of housing and the number of Medicaid-eligible (i.e., low-income) children residing in neighborhoods with pre-1950 housing.

The High Intensity Targeted Screening (HITS) program that CDC and the Chicago Department of Public Health (CDPH) conducted in 2001 is an example of a targeted screening effort. The project's goal was to assess the prevalence of EBLs among children aged 1 to 5 years in two Chicago neighborhoods. Teams of CDPH and CDC staff and community members went door-to-door to test children's BLLs and to ask questions about lead poisoning risk factors. These teams discovered that within these Chicago communities—areas that were characterized by high percentages of racial and ethnic minority residents, poverty, and old housing—27% of children had EBLs. This statistic is more than 12 times the national average. Seventy percent of the children tested were enrolled in Medicaid and had received some health care services. Although Medicaid requires that all enrolled children be tested for lead, CDPH records indicated that 61% of the children identified had never been tested before. These results indicated that Medicaid providers in the project areas are not adequately screening this high-risk population. LPPB is working closely with grantees to encourage and facilitate partnerships between the CLPPPs and Medicaid. Both state Medicaid agencies and the Center for Medicare Services (CMS) have expressed interest in this initiative. In addition, CMS has begun to survey state lead programs to identify factors that prevent Medicaid enrolled children from being tested appropriately.

Surveillance of Children with EBLs

Continued surveillance of blood lead levels nationally through NHANES to allow for national estimates of exposure and expanded state and local capacity for electronic reporting of blood lead test results to allow monitoring of high risk populations at the local level are essential to inform CLPPPs' program direction and effectiveness.

LPPB entered into a contract with Battelle, Inc. to develop risk indices based on census data, residential tax records, birth data, and other sources that CLPPPs could use to identify children at high risk for lead poisoning. Battelle, Inc. not only is assessing LPPB's current data-processing system but is also helping make surveillance data easier to analyze and improving the ability to generate more timely routine reports.

In September 2002, LPPB convened a meeting of program and surveillance managers to discuss numerous aspects of using surveillance data to drive program activities. Approximately 125 grantee staff attended a workshop entitled "Using Surveillance Data to Achieve Elimination". During this highly interactive meeting, participants shared common concerns about and suggestions for improving surveillance systems at the national, state, and local levels. The meeting also provided tools to help meet increasing expectations for lead surveillance across the country. LPPB relied heavily on the input of its state and local partners to shape changes in the national surveillance system of children with EBLs.

During 2001–2002, LPPB increased use of geographic information systems (GIS) to assist CLPPPs in targeting housing most likely to contain lead hazards. GIS mapping methods,

used in conjunction with other available information and data including the U.S. census, can help ensure that primary and secondary prevention efforts reach children at high risk for lead poisoning.

LPPB currently is developing a childhood lead poisoning component of the National Electronic Disease Surveillance System. This Web-based laboratory reporting system has been implemented by using infectious disease programs as its starting point. Childhood lead poisoning will be the first noninfectious disease program at CDC to go online with the new system.

Training CLPPP Members

For more than 16 years, Louisville, Kentucky, in cooperation with CDC, has hosted the National Lead Training and Resource Center (NLTRC), with instruction provided by the Jefferson County Division of Environmental Health and Protection. When LPPB was established in 1990, the NLTRC became part of LPPB. The 4 1/2-day curriculum the NLTRC offers provides an overview of LPPB as well as of human biology; epidemiology; surveillance and database systems; GIS; environmental issues (e.g., regulations, test methods, abatement); primary prevention; medical and case management; community outreach and health education related to lead exposure; and HUD Title X (Residential Lead-Based Paint Hazard Reduction Act of 1992) perspectives. Participants also have an opportunity to join in site visits at several Louisville locations. The NLTRC training provides a forum for state and local programs to share innovative solutions to common problems and to train new staff efficiently.

In February 2002, LPPB hosted its biannual Health Education Conference in Atlanta. Approximately 350 CLPPP program managers, health educators, and communications staff attended. Selected CLPPPs showcased innovative and effective community outreach activities and public education campaigns. The work of such partners is crucial to developing and implementing a national public health education policy.

Strategic Partnerships

The national Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) provides critical expert consultation and guidance not only to LPPB but also to the Director of CDC and to the Secretary of HHS on matters related to childhood lead poisoning. The committee consists of twelve experts (confirmed by the Secretary of HHS) in medicine, higher education, industry, and advocacy. Additionally, seventeen ex-officio members and liaisons participate in nonvoting ACCLPP activities and in ad hoc work groups. In 2001, the Case Management Work Group rewrote the previously mentioned new recommendations. The Targeted Screening Work Group has begun to address issues related to improving screening of Medicaid-eligible children.

CDC works closely with HUD, EPA, and CMS. HUD and EPA have had interagency agreements with CDC to support housing interventions and the National Lead Information Center, which provides the general public and professionals with information about lead hazards and their prevention. Both agencies also have representation on the national ACCLPP. In 2002, LPPB staff extended an invitation to the U.S. Department of Agriculture's Women, Infants and Children (WIC) program officials to explore initiatives that will leverage state and local WIC programs as stakeholders in childhood lead poisoning prevention.

The Alliance for Healthy Housing is the largest national organization advocating resources, policies, and practices to protect children from lead hazards. As previously described, this advocacy organization is developing a CDC-funded resource database called "Building Blocks for Primary Prevention in Public Health." The Alliance also works with state and federal legislatures to change laws and policies related to childhood lead poisoning.

The Healthy Homes Project, sponsored by CDC, conducted in-home assessments and interventions for a variety of environmental hazards in high-risk housing in Boston. Data gathered from the assessments were used to correlate specific home environmental conditions with adverse health effects in children residing in those homes. The findings resulted in grants (maximum \$10,000 each) from a community-based organization to 15 homeowners. This demonstration project led to additional funding through HUD and showed that 1) partnership with community-based organizations was critical to success, 2) securing outside funding for repairs can have a major effect on success, and 3) in-home education may lead to behavior change.

CMS is an ex officio member of ACCLPP and an important partner for CDC's efforts to promote significant change among state Medicaid programs to maximize opportunities to identify children at risk for lead poisoning. CDC and CMS are working together to ensure that blood lead screening services are appropriately targeted to children enrolled in Medicaid. CMS staff informed CDC that the national office will continue to encourage state Medicaid directors to explore ways to more effectively reach the children who have the greatest need for services. In addition, CDC works collaboratively with the Women Infants and Children Supplemental Nutrition Program (WIC) and Health Resources Service Administration (HRSA)-funded health centers who serve the same at-risk populations.

Challenges to Achieving the 2010 Goal of Lead Poisoning Elimination

One critical area that LPPB and CLPPPs face is how to increase physician awareness of the need to assess children living in high-risk housing for exposure to lead hazards. Because the number of children with EBLLs has significantly declined, many primary care providers and pediatricians no longer perceive lead poisoning as a threat to their patients. Indeed, CLPPPs have reported that even in urban areas with high numbers of children living in poverty, health care providers do not recognize the continuing threat of lead exposure.

Another extremely important goal is to find a mechanism through which HUD, EPA, and CDC can more effectively partner and use finite resources to focus on geographic areas at highest risk for residential lead hazards.

Finally, CLPPPs face real challenges in developing concrete measures of program effectiveness that are explicitly linked to such short-term objectives as decreased lead exposure as well as to our long-term objective of eliminating childhood lead poisoning by 2010. Addressing such challenges will be the focus of 2003–2004 program activities.

Summary

The drastic reduction in the number of children harmed by exposure to lead hazards is one of the most compelling successes in recent public health history. Sixty years ago, millions of U.S. children were routinely exposed to the toxic effects of lead. Multifaceted “attacks” on this environmental hazard have eliminated several exposures to young, vulnerable children. More resources that are more effectively directed in concert with other stakeholders’ efforts can make lead poisoning elimination a reality. CDC believes that with a concerted effort, especially in the area of primary prevention of lead poisoning of children, the nation’s health objective to “eliminate elevated blood lead levels in children,” as presented in HHS’ *Healthy People 2010*, will be achieved.