

The Tennessee Childhood Lead Poisoning Prevention Program

2004 LEAD ELIMINATION PLAN

Preventing and eliminating lead poisoning in Tennessee children

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INTRODUCTION

The Tennessee Childhood Lead Poisoning Prevention Program began in 2001 as a health promotion effort to educate the Tennessee populace on the dangers of lead poisoning and an effort to track blood lead screening tests. Memphis-Shelby County had its own program that was not connected to the rest of the state. Knowing that in order to grow and establish a comparable program to other CLPPP programs, the Tennessee Department of Health (TDH) began to put together partners to provide depth and productivity to the Tennessee CLPPP.

Today, the Tennessee CLPPP has evolved into a multi-faceted, multi-partner, collaborative, and progressive program that provides all the necessary components to meet the Healthy People 2010 objective of eliminating childhood lead poisoning. The program utilizes the research, design, and consulting capabilities of Tennessee's top-notch universities, the environmental investigator powers of the Tennessee Department of Environmental Conservation, the health services and education provided by the county and regional Health Departments, and the well-established program with the Memphis-Shelby County CLPPP, all combined under the direction of the Program Director at the TDH. The partnering aspects to the program allow for flexibility as focus and initiatives change as well as continuous growth and refinement of each program objective.

The Elimination Plan of the Tennessee CLPPP is a guidance document to strategically and programmatically reach the goal of eliminating the risk and incidence of lead poisoning in Tennessee children. This document includes details on surveillance and epidemiology; communication and education; the program's policies and systems; the Work Plan outlining all objectives and partner contributions; current data and statistics; and policy and service information.

Our Vision:

The Vision for the State of Tennessee Childhood Lead Poisoning Prevention Program is to prevent and eliminate childhood lead poisoning by:

- *Early detection of lead poisoned children through promotion and screening*
- *Tracking lead with state-of-the-art surveillance systems*
- *Reducing children's exposure to lead hazards in the environment*
- *Providing case management and services for lead poisoned children and their families*
- *Creating and promoting public and private partnerships to eliminate lead poisoning in Tennessee*

BACKGROUND

What is Lead Poisoning?

Lead poisoning is considered to be the most serious environmental threat to children's health. Approximately 434,000 U.S. children age 1-5 years have blood lead levels greater than the Centers for Disease Control and Prevention (CDC) recommended level of 10 micrograms of lead per deciliter of blood. The term 'lead poisoning' gives special attention to children whose blood lead levels (BLLs) are greater than or equal to 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$). Many studies point to a link between BLLs greater than or equal to 10 $\mu\text{g}/\text{dL}$ and harmful health effects, in particular, learning disabilities and behavior problems.

Lead poisoning can affect nearly every system in the body. Because lead poisoning often occurs with no obvious symptoms, it frequently goes unrecognized. Lead poisoning can cause learning disabilities, behavioral problems, and at very high levels, seizures, coma, and even death (CDC reference <http://www.cdc.gov/nceh/lead/about/about.htm>). Lead is neurotoxic and particularly harmful to the developing nervous systems of fetuses and young children. Extremely high BLLs (i.e., $\geq 70 \mu\text{g}/\text{dL}$) can

cause severe neurologic problems (e.g., seizure, coma, and death). However, no threshold has been determined regarding lead's harmful effects on children's learning and behavior. In 1990, the U.S. Department of Health and Human Services (HHS) established a national goal to eliminate BLLs >25 $\mu\text{g}/\text{dL}$ by 2000; a new goal targets elimination of BLLs ≥ 10 $\mu\text{g}/\text{dL}$ in children aged <6 years by 2010.

Who Is At Risk for Lead Poisoning?

National

Lead poisoning remains a preventable environmental health problem in the United States. One of the specific national goals within HHS's *Healthy People 2010* initiative is the total elimination of BLLs ≥ 10 $\mu\text{g}/\text{dL}$ in children age 1 -5 years old. Analysis of national data has shown that although childhood lead poisoning occurred in all populations, the risk is higher for persons having low income, living in older housing, and belonging to certain racial and ethnic groups. For all income levels, non-Hispanic black children have a greater risk of elevated blood lead levels (EBLL) than white children; the disparity is even greater for black children living in families below the poverty line. Children enrolled in Medicaid have three times the prevalence of elevated blood lead levels compared to non-Medicaid children.

Tennessee

Almost fifty-two percent (51.8%) of the children who were confirmed to have elevated blood lead levels lived in the six metropolitan counties of Tennessee (Appendix A & B). Forty-eight percent (48.2%) of children with elevated blood lead levels were diagnosed in the 89 non-metropolitan counties. In these counties, the number of cases of confirmed elevated blood levels in children is directly related to the number of pre-1950s housing units and to the total number of children screened (Appendix B).

These analyses indicate that attempts should be made to identify lead-poisoned children throughout the state and not just in metropolitan areas. That children live in pre-1950s housing explains about 21.2% of the cross-county variation in the number of confirmed EBLL cases. While pre-1950s housing is the

strongest predictor, other indicators such as poverty and TennCare status should be considered. The risk factors for lead poisoning include:

- **Children.** Blood lead levels are highest among young children (less than six years old) since their smaller body weight results in greater exposure per pound. Twenty-eight percent of Tennessee's population is younger than 18 years old. In 2000, the population of children under six years old was 467,418 and children under four years of age numbered 374,880. In 2003, there were 51,595 blood lead screening tests performed on children under six years old in Tennessee (see Appendix A). Out of the number of tests performed, 199 children were confirmed to be lead poisoned (see Appendix A).
- **Poverty.** Children living in poverty are at higher risk of lead poisoning than other children and more than a quarter of the very young children in Tennessee live in poverty. Per capita income in Tennessee in 2000 was 90% of the national average, giving it a rank of 34th in per capita income. Tennessee's average median income was ranked 42nd. Thirty-two percent of Tennessee jobs pay poverty wages. Tennessee ranked 48th among the 50 states in average grant amount through Families First. Tennessee ranked 50th in child support enforcement. In Shelby County, almost 30% (23,500) of the children are below the poverty level. Tennessee ranked 13th among the states for having the most food-insecure households. The total number of children (0-5 years old) participating in the WIC program as of October 2002 was 117,850. There are 130 WIC Clinic sites with at least one in each of the 95 counties.
- **Minorities.** Children of racial/ethnic minority groups are at higher risk of lead poisoning than other children. In 2000, the population of children under six years old was 75.2% white, 23.3% black, and 1.5% other races. According to the 2000 Bureau of Census population estimates, 2.2% of Tennesseans identified themselves as being of Hispanic origin. The Hispanic population is thought to be larger than the reported number, due to the growing population of migrant workers and undocumented residents across the state. In 2002, there were approximately 26,000 Hispanics in Nashville and 150,000 in Memphis. Tennessee has a wide variety of ethnic groups

in addition to Hispanics. Southeast Asians are the second largest group (52, 564) and the state is the fifth largest Kurdish resettlement in the nation. Refugees and legal immigrants are now arriving from African, Baltic, Central Asian and Southeast Asian countries. Over 70 different languages are spoken as the primary language of the home in metro Nashville. Each major medical institution in the state has a network of locally available interpreters for a wide range of linguistic needs. For Spanish translation, most health departments have bi-lingual staff or translators available. The Tennessee Department of Health (TDH) has contracted with a telephonic service utilized mainly for languages other than Spanish. TDH has written and implemented a Title VI English Proficiency Policy and Procedures applicable to all Health Service Administration programs that are receiving federal financial assistance including local health department staff. During the 2001-2002 program years, more than 18,000 children were enrolled in Tennessee *Head Start* programs in the following ethnic groups: White, 49%; Black, 43%; Hispanic, 5%; and Other, 3%.

- **Medicaid Population.** On January 1, 1994, Tennessee made history by withdrawing from the federal Medicaid program and implementing a health care reform plan (TennCare) where service is offered through managed care organizations (MCOs) and behavioral health organizations. Tennessee was granted federal approval for a five year demonstration project and has been re-approved through a series of extensions. On July 1, 2002, Tennessee reached a new five-year agreement with the Centers for Medicaid and Medicare to continue TennCare. The agreement separated TennCare into two products: *TennCare Medicaid* is a continuation of the federal Medicaid program with a few minor changes in benefits, and three-tiered pharmacy co-payment structure that began January 1, 2003; *TennCare Standard* is similar to a commercial HMO package serving adults below 100% of the federal poverty level (FPL), children below 200% FPL and people who are medically eligible. Twenty-four percent of the state's total population is enrolled in TennCare. Enrollment in 2000 was approximately 1,316,216, of which 795,968 were

Medicaid eligible and 520,248 were in the uninsured/uninsurable categories. The state uninsured rate for children is at a low of 4.12%.

- **Housing.** There are several ways that young children may be exposed to lead; the most common is living in a housing unit built before 1950. According to the 1% Public Use Microdata Sample of the 2000 U.S. Census, there are approximately 314,000 pre-1950s housing units in Tennessee. These older homes are distributed across all regions of the state as shown on the map (see Appendix B); each of the 20 counties in yellow has at least 3,000 pre-1950 housing units. Sixteen percent of these homes are in non-metropolitan areas, 11% are in the Knoxville area, 15% are in the Memphis metropolitan area, 13% are in the Nashville area, and the remaining 46% are in other metropolitan or combined metropolitan and non-metropolitan areas. The percentage of pre-1950s housing units in which children under age 6 live ranges from 9% to 13% across the metropolitan and non-metropolitan areas of Tennessee. Thirteen percent of the 46,000 older housing units in the Memphis metropolitan area include young children, as do 12% of the 40,000 pre-1950s housing units in the Nashville area. In non-metropolitan areas, 9.5% of 51,000 housing units include young children (see Appendix B).

Race and poverty status are considered when estimating the possibility that a child is lead poisoned. Table 4 in Appendix B presents percentages of housing units in Tennessee that are occupied by Blacks or by persons who are not Black, by whether or not the household is below 200% of the poverty level in 1999, by ages of the occupants, and by the year that the housing unit was built. Among housing units occupied by households who are below 200% of the poverty level, 4.0% include children under age 6 who are not Black, and 1.9% include children who are Black. Among housing units occupied by households who are above 200% of the poverty level, 4.8% include children under age 6 who are not Black, and 0.6% include children who are Black. One implication of these results is that Black children from poor households are more likely than those who are not poor to reside in pre-1950s housing. Poverty level of the household is not an

important factor to consider when evaluating the housing conditions of children who are not Black; poor households are about as likely to live in pre-1950s housing as those who are not poor.

According to the Tennessee Department of Housing and Urban Development (THDA), 70% of all homes in Tennessee were built before 1978. THDA determined the probability of the existence of lead-based paint (LBP) in Tennessee's housing units across the state to be an average of 49.64% as shown in Appendix B.

- **Industry.** Tennessee has many industries with the potential to expose workers and the environment to high lead levels. With supplemental funding, a pilot industrial intervention was conducted in FY 02-03 after a battery plant was identified as one potential source of lead exposure in the childhood lead poisoning cases. Three more cases of plant-related EBLL have been identified since the project began. During the first EBLL risk assessment, dust-wipe samples were collected at the plant from non-production common areas. The results of the samples for the floors were far in excess of the 40 $\mu\text{g}/\text{ft}^2$ dust lead hazard standard. Both EBLL investigations also showed high lead levels associated with clothing and vehicles of the parents who work at the plant. The 1,000 plus employees were walking out of the facility with lead on their shoes and in their cars, contaminating an unknown number of places where pregnant women and young children reside or frequent. Other industries need similar investigations with intervention where necessary.
- **Elevated Blood Lead Levels (EBLLs).** There were 112,311 child blood lead screenings conducted in 95 counties in Tennessee during 2002 and 2003 (see Appendix A). Out of that number, there were 492 children confirmed as lead poisoned, with EBLL $\geq 10 \mu\text{g}/\text{dL}$. In each of the years 2000-2002, 5% of the children screened in Shelby County had EBLL. Children with confirmed blood lead levels $\geq 10 \mu\text{g}/\text{dL}$ are entered into the Tennessee case-management system and followed until case closure through the efforts of local health departments as well as private clinics.

In a recent CDC statistical model calculating probable numbers of lead poisoned children 1-5 years old, Tennessee was ranked 19th among the states and estimated to have 11,900 children with EBLL. Memphis ranked 12th among the cities and was estimated to have 3,800 children with EBLL. Chattanooga was estimated to have 700 children with EBLL and Knoxville to have 500.

The Public Impact of Lead Poisoning

One out of every six young children in America runs a serious risk of growing up less intelligent than was originally determined by his or her genetic code. These preschoolers all have dangerously high levels of lead in their blood. Chances are, most of them will never develop physical symptoms that will alert their parents to consult a doctor. They are, instead, being silently and efficiently robbed of their futures and their inner abilities to decode the world around them.

Lead poisoning can affect nearly every system in the body. Because lead poisoning often occurs with no obvious symptoms, it frequently goes unrecognized. Lead is neurotoxic and particularly harmful to the developing nervous systems of fetuses and young children. Extremely high BLLs (i.e., ≥ 70 $\mu\text{g}/\text{dL}$) can cause severe neurologic problems (e.g., seizure, coma, and death). However, no threshold has been determined regarding lead's harmful effects on children's learning and behavior. In 1990, the U.S. Department of Health and Human Services (HHS) established a national goal to eliminate EBLs >25 $\mu\text{g}/\text{dL}$ by 2000; a new goal targets elimination of BLLs ≥ 10 $\mu\text{g}/\text{dL}$ in children less than 6 years old by 2010. Many studies point to a link between EBLs greater than or equal to 10 $\mu\text{g}/\text{dL}$ and harmful health effects, in particular, learning disabilities and behavior problems and at very high levels, seizures, coma, and even death.

As shown in the attached map of confirmed cases, children less than 6 years old were screened and found to be poisoned in all regions of Tennessee (see Appendix A). The numbers of confirmed cases were higher in the metropolitan counties and the non-metropolitan counties with more than 2,650 pre-

1950s housing units than they were in counties with fewer older homes. Although these counties constitute high risk areas for lead poisoning, all children in the State should be tested for lead.

THE LEAD ELIMINATION PLAN

The Public Health Approach: Logic Model

The Tennessee Lead Elimination Plan was developed using a public health logic model. Development of a logic model engages stakeholders and guides program development and evaluation planning simultaneously. This provides a forum to identify and consider stakeholders' differences and priorities. A logic model can help clarify program strategy, justify why the program will work, assess the potential effectiveness of an approach, identify appropriate outcome targets and priorities for allocating resources. Logic models describe the core components of the program, illustrate the connection between program components and expected outcomes, and include pertinent information about program context.

The Tennessee Childhood Lead Poisoning Elimination Plan will be used as a guidance document for current and future CLPPP planning efforts, a benchmarking document to measure progress, and a communications document to stakeholders and partners. It will be distributed through the CLPPP Advisory Committee to health care providers (primary care pediatricians, family practitioners, nurse practitioners, and pediatric medical residents), environmental and child health agencies, leaders of faith communities serving lead poisoning high risk populations, and all CLPPP partners.

Partnerships

Partnerships are central to the development and successful implementation of a public health strategy for childhood lead exposure. The TDH has contracted formal partnerships between the following agencies to fulfill the CDC grant requirements for the CLPPP: several University of Tennessee (UT) entities including UT-Knoxville Safety Center (UTSC), UT Extension Service (UTES), UT-Memphis

(UTM); Tennessee Department of Environment and Conservation (TDEC), the Memphis/Shelby County Health Department (MSCHD), and Tennessee Metro Health Departments.

The Tennessee Department of Health is organized into three levels of administration and service delivery:

- The Central Office addresses strategic planning, policy development, program management, contract monitoring and data analysis functions
- The seven rural regional offices are responsible for the health services offered in a specified geographic area of 7- 19 counties
- The six metropolitan regional offices are responsible for the health services offered on each metropolitan county

The TDH “Child Health Manual” is the guide for local health department services for children. The manual follows the Early Periodic Screening Diagnosis and Treatment (EPSDT) guidelines that require a blood lead level screen at 12 and 24 months with risk assessment occurring on all other visits between 0 – 72 months. In July 2001, TDH entered into a contract with TennCare (Tennessee’s Medicaid program) to promote and conduct the “Caring for Kids” well child exam – the EPSDT; 25,921 exams were conducted by local health departments in the last quarter of 2002. Many other services offered through the local health department or contracted through TDH provide opportunities to promote CLPPP goals. Home visiting projects that are designed to address parent training and prevention of child abuse include assuring that children receive health screens. Local health department staff members also provide home visiting services to families with young children who have been dropped from the State’s ‘welfare to work’ program. The TDH CLPPP Case Manager, and the CLPPP Medical Director (who is located at the University of Tennessee-Memphis), provide medical consultation to health care providers regarding medical case-management of children with EBLL and provide technical support through the TDH web site. The Tennessee Health Care Campaign, an Early Child Outreach program, includes CLPPP materials in trainings and educational packets distributed to parents and child care providers. Head Start programs

include lead screening as part of their health management system, identifying 16 children with EBLL in 2001.

The University of Tennessee Extension Service, through faculty at the state level and educators in all 95 Tennessee counties, provide CLPPP primary prevention education to the general public, parents, childcare educators, 4-H and other youth, underserved and minority populations. UTES developed English and Spanish exhibits, posters, and brochures to be used in health education efforts. UTES also designed print and web-based the CDC's medical case management protocols for EBLL that were distributed to health departments and TennCare providers as well as the TDH website.

The University of Tennessee Safety Center designed, implemented, and maintains the CLPPP surveillance system as well as conducts and distributes analysis reports of all blood lead screening data. UTSC has also conducted a survey of Tennessee primary care physicians and pediatricians regarding current protocols for lead screening, developed lead health promotion communication materials, and provided CLPPP resources to physicians in several east Tennessee counties.

Middle Tennessee State University evaluated the progress toward achievement of the CLPPP goals and objectives. Dr. Weatherby served as director of evaluation activities carried out at MTSU and as consultant for program evaluation to the TDH and other university partners. His duties included the systematic assessment of the operations and outcomes of the program, production of evaluation findings that are used to monitor and improve the program as well as to provide information necessary for policy makers, and document progress made in childhood lead poisoning prevention.

MTSU also developed and managed an industrial site lead contamination intervention in collaboration with TDH. Over 750 employees in a battery plant have been educated and a screening of related children and pregnant women was conducted at the end of March 2003. Additionally, MTSU has been awarded a grant to conduct the Lead Elimination Action Program (LEAP) and will focus all lead hazard reduction activities on using interim controls as specified by HUD Guidelines, Chapter 11. Interested independent contractors are participating, as well as the collaboration of TDEC, The Center for Construction Education and Training (TC CET) and TDH/CLPPP.

Tennessee Department of Environment and Conservation conducts environmental investigations for children with EBLs. The TDEC's Lead Hazard Program administers and enforces lead-based paint abatement regulations for accrediting training providers and certifying abatement professionals.

The Memphis-Shelby County Health Department CLPPP collaborates with the City of Memphis Division of Housing and Community Development and Shelby County Department of Housing to provide services through a Housing and Urban Development Lead-Based Paint grant to identify lead-poisoned children and to facilitate safe Lead Paint hazard removal from properties with existing hazards.

**The Tennessee Childhood Lead
Poisoning Prevention Program
Elimination Plan**

WORK PLAN

Strategic Direction One: *Surveillance and Epidemiology*

I. Definitions

Surveillance is the ongoing and systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice. Surveillance is closely integrated with timely dissemination of these data and their translation into action.

Epidemiology is the study of the distribution and determinants of health-related states of events in specified populations and the application of this study to control health problems.

II. Goal:

Monitor and track all blood lead levels of children <6 years old in Tennessee.

III. Objectives/Strategies

- Objective A. Enter, quality control, and tabulate the July 1, 2004 through May 2009 blood lead screening data, including all historical data, into the TN CLPPP lead surveillance database for analysis within two weeks of submission.

Performance measures:

- a. Impact: Complete entry of all laboratory data sent to TDH to electronic database for analysis within two weeks of submission.
 - b. Quality of input: Weekly to bi-weekly transfer of data from laboratories to UT for entering into database.
 - c. Quality of output: Timely data for housing risk determination, case-management, program evaluation, and national surveillance.
 - d. Cost efficiency: Efficient use of labor for data gathering, tabulation, and analysis.
 - e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).
- Objective B. Merge MSCD BLL data with TDH BLL data quarterly through June 30, 2009.

Performance measures:

- a. Impact: Complete merging of the two data sets (Memphis/Shelby County with TDH).
- b. Quality of input: Electronic merging of the two data sets on quarterly basis.
- c. Quality of output: Timely and complete data for housing risk determination, case-management, program evaluation and national surveillance.
- d. Cost efficiency: Eliminates redundancy of systems.

- e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).
- Objective C. Monitor the number of Medicaid/TennCare lead screenings quarterly by June 30, 2009.
Performance measures:
 - a. Impact: Compile and merge Medicaid/TennCare data with BLL surveillance data.
 - b. Quality of input: Child data matched based on names, date-of-birth, addresses, and/or social security/Medicaid number.
 - c. Quality of output: Timely and complete data for housing risk determination, case-management, program evaluation and national surveillance.
 - d. Cost efficiency: Reduces labor needed for determining high risk children.
 - e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).
- Objective D. Increase laboratory electronic submissions for surveillance database from 70% to 90% by June 30, 2009.
Performance measures:
 - a. Impact: Monitoring of all childhood blood lead.
 - b. Quality of input: Determine labs not reporting.
 - c. Quality of output: All labs reporting.
 - d. Cost efficiency: Improved monitoring of all childhood blood lead..
 - e. Quality of resources: Agencies responsible:UTSC (CLPPP Surveillance Program Manager).
- Objective E. Increase laboratory electronic submissions for surveillance database from 70% to 90% by June 30, 2009.
Performance measures:
 - a. Impact: All formats of electronic screening data is accepted and merged into database.
 - b. Quality of input: Significant increase in laboratory electronic data submissions and a significant decrease in laboratory paper-based data submissions.
 - c. Quality of output: Timely and complete data for housing risk determination, case-management, program evaluation and national surveillance.
 - d. Cost efficiency: Decreases labor needed for hand-entry of data.
 - e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).

- Objective F: Provide TDH weekly reporting of EBLLs for case management through June 30, 2009.
 Performance measures:
 - a. Impact: Each laboratory record with an EBLL is recorded separately and sent to TDH.
 - b. Quality of input: Number of EBLLs at TDH match reported number of EBLLs in surveillance database.
 - c. Quality of output: Timely and complete data for housing risk determination, case-management, program evaluation and national surveillance.
 - d. Cost efficiency: Reduces labor needed to track case management.
 - e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).

- Objective G: Prepare quarterly and annual data analysis reports for CDC and TDH through June 30, 2009.
 Performance measures:
 - a. Impact: Conduct statistical and frequency analysis on TDH BLL screening data.
 - b. Quality of input: Complete reports with all requested information provided to CDC and TDH including quarterly, annual, and statistical reports.
 - c. Quality of output: Timely and complete data reported for housing risk determination, case-management, program evaluation and national surveillance. Surveillance database used to provide reports on a monthly/quarterly/annual basis and as needed basis.
 - d. Cost efficiency: Reduces redundant reporting.
 - e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).

- Objective H: Transition from current surveillance data management to National Electronic Disease Surveillance System (NEDSS) program at TDH by June 30, 2009.
 Performance measures:
 - a. Impact: Complete conversion to NEDSS database management system.
 - b. Quality of input: Transfer is made with no loss of data or capabilities.
 - c. Quality of output: Timely and complete data reported for housing risk determination, case-management, program evaluation and national surveillance.
 - d. Cost efficiency: Reduces labor and redundant systems.
 - e. Quality of resources: Agencies responsible: UTSC (CLPPP Surveillance Program Manager).

Strategic Direction Two: Professional Awareness and Involvement

I. Definitions

Professional Awareness of the risk of lead poisoning refers to physicians, nurses and home visitors having an understanding of the risk posed by lead. Mastering this competency provides an in-depth understanding of the health risks of lead, related associations and sources of information, and support for maintaining a high level of mastery in the dynamic world of a healthcare provider.

Involve means to engage as a participant. Healthcare providers must be included in decisions and be influenced to become stakeholders in the fight against childhood lead exposure.

II. Goal

Implement a state-wide childhood lead poisoning elimination plan.

III. Objectives/Strategies

- **Objective A.** Conduct CLPPP advisory committee meeting quarterly, July 1, 2004- June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: membership of advisory committee with appropriate members; advisory committee meetings held; meeting minutes distributed.
 - c. Quality of output: commitment of members to meeting and implementing plan.
 - d. Cost efficiency: video-conferencing rather than face-to-face meetings
 - e. Quality of resources: Agencies responsible: UTE (CLPPP Health Educator), TDH (State CLPPP Director).

- **Objective B.** Revise and distribute childhood lead poisoning elimination plan yearly, July 1, 2004- June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: Plan edited and distributed to health-care providers, environmental and child health agencies and leaders of faith communities (serving high-risk populations).
 - c. Quality of output: dissemination plan.
 - d. Cost efficiency: electronic transmission as much as possible.
 - e. Quality of resources: Agencies responsible: UTE (CLPPP Health Educator), TDH (State CLPPP Director), and MCSHD (CLPPP Director), Advisory Committee.

Strategic Direction Three: ***Community Awareness and Outreach***

I. Definitions

Community Awareness implies knowledge gained through one's own perceptions or by means of information within a body of people having common rights, privileges, or interests, or living in the same place under the same laws and regulations.

Outreach refers to attempting to provide services beyond conventional limits, as to particular segments of a community.

II. Goal

Target resources to families at highest risk of lead poisoning.

III. Objectives/Strategies

- Objective A. Screen 55,000 children/pregnant women at high risk of lead poisoning yearly by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated
 - b. Quality of input: Resources targeted in highest risk areas
 - c. Quality of output: Increased screening rates
 - d. Cost efficiency: use data from EBLL system to track highest areas
 - e. Quality of resources: Agency responsible: UTE (CLPPP Health Educator) and TDH (CLPPP Director)

- Objective B. Educate 300 community leaders per year about need to screen children/pregnant women at high risk of lead poisoning by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated
 - b. Quality of input: partner with Head Start
 - c. Quality of output: Increased partnerships and data
 - d. Cost efficiency: Work through county extension agents
 - e. Quality of resources: Agencies responsible: UTE(CLPPP Health Educator)

- Objective C. Track blood lead levels of pregnant women screened in health departments by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated
 - b. Quality of input: With partners, write protocol and develop mechanism for tracking blood lead levels of pregnant women screened in health departments

- c. Quality of output: Tracking and monitoring blood lead levels of pregnant women screened in health departments
 - d. Cost efficiency: Tracking system developed and used
 - e. Quality of resources: Agencies responsible: TDH (CLPPP Director)

- Objective D. Deliver CLPPP educational programs to 500 high-risk families yearly by June 30, 2009.
Performance resources:
 - a. Impact; Childhood lead poisoning reduced/ eliminated
 - b. Quality of input: Conduct educational sessions to high-risk families through existing programs
 - c. Quality of output: Increased awareness of childhood lead poisoning
 - d. Cost efficiency: Work through local extension agents
 - e. Quality of resources: Agency responsible: UTE (CLPPP Health Educator), MSCHD (CLPPP Director)

- Objective E. Increase screening in WIC clinics from 9,500 per year to 12,000 per year by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated
 - b. Quality of input: Increased screening of high-risk children and pregnant women.
 - c. Quality of output: Increased WIC Screenings and Confirmatory Results.
 - a. Cost efficiency: Assess WIC clinics to determine those most likely to serve high-risk children and pregnant women; target identified clinics for initiatives to promote screening.
 - d. Quality of resources: Agency responsible: TDH (CLPPP Director) & MSCHD (CLPPP Director)

- Objective F. Provide CLPPP education for 50% of high-risk housing agencies by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated
 - b. Quality of input: Increased screenings of high risk children and improved case-management.
 - c. Quality of output: Increased screening and improved compliance with case-management protocol.
 - d. Cost efficiency: Assess housing agencies to determine those most likely to serve high-risk children and pregnant women; collaborate with identified agencies to promote screening.
 - e. Quality if resources: Agency responsible: UTE (CLPPP Health Educator) and MSCHD (CLPPP Director)

Strategic Direction Four: ***Case Management***

I. Definition

Case Management is the process by which all health-related matters of a case are managed by a physician or nurse or designated health professional. Case managers coordinate designated components of health care, such as appropriate referral to consultants, specialists, hospitals, ancillary providers and services. Case management is intended to ensure continuity of services and accessibility to overcome rigidity, fragmented services, and the mis-utilization of facilities and resources. It also attempts to match the appropriate intensity of services with the patient's needs over time.

II. Goal

Assure proper follow-up for children with elevated blood lead levels.

III. Objectives/ Strategies

- **Objective A: Provide education/information to 90% of children with unconfirmed EBLL screened in health departments or WIC clinics within 30 days of their initial screening by June 30, 2009.**
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated
 - b. Quality of input: Increase in follow-up testing.
 - c. Quality of output: Quarterly from Stellar and Weekly from Case-management logs.
 - d. Cost efficiency: Compliance with case-management protocol.
 - e. Quality of resources: Agencies: UTAES (CLPPP Health Educator); MSCHD (CLPPP Health Educator)

- **Objective B: Provide education/information on medical management of childhood lead poisoning to 800 health-care providers serving children in high risk populations by June 30, 2009.**
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: medical providers who need to increase compliance with follow-up testing protocol identified and educated.
 - c. Quality of output: Increase in follow-up testing at Primary Care Clinics.
 - d. Cost efficiency: Improved compliance with case-management protocol.
 - e. Quality of resources: Agency: UTAES (CLPPP Health Educator)

- Objective C: Identify the source of lead exposure in 95% of all children identified with a confirmed BLL of $\geq 20\mu\text{g/dL}$ or two consecutive BLLs 15-19 $\mu\text{g/dL}$ and report results of each environmental investigation to appropriate parties in timely manner by June 30, 2009.

Performance measures:

- a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: Number of investigations conducted compared to number needed.
 - c. Quality of output: Source of lead exposure identified for children with EBLL.
 - d. Cost efficiency: Source of lead exposure identified for children with EBLL. Within two weeks of completion of each environmental investigation TDEC will: a) provide CLPPP staff and the requesting physician a written summary report of each environmental investigation including options for eliminating and/or reducing the lead hazards identified; b) send a letter to inform the property owner of the lead hazards identified and his/her obligation under federal law to inform current and/or future tenants of the hazards; c) send a copy of the property owner's letter to the child's parent/care-giver.
 - e. Quality of resources: Reports: Quarterly from Stellar and TDEC reports. Agency: TDEC (Program Director)
- Objective D: The case-management program will case-manage children with a confirmed BLL of $\geq 20\mu\text{g/dL}$ (or two consecutive BLLs 15-19 $\mu\text{g/dL}$) where the source of lead has been identified until the child is in a lead-safe environment by June 30, 2009.

Performance measures:

- a. Impact: Childhood lead poisoning reduced/eliminated.
- b. Quality of input: Collaborate with community partners to assure goods and services necessary to protect a child with EBLL.
- c. Quality of output: Children protected from lead hazards.
- d. Cost efficiency: More efficient to prevent lead poisoning than reduce it from a high level.
- e. Quality of resources: Agency: TDH (CLPPP Case-Manager); TDEC reports and case-management files

Strategic Direction Five: ***Lead Hazard Reduction and Regulation***

I. Definition

Regulation refers to a principle, rule, or law designed to control or govern conduct of lead based paint renovation. Lead hazard reduction, including abatement, and subsequent cleanup in affected properties, must be performed according to the methods described in the regulation, whether the work is required by the Health Department or is undertaken voluntarily. This law would apply to persons, including assessing agencies, who do regulated lead work in or for affected property.

II. Goal

Eliminate lead-based paint hazards in Tennessee's privately-owned and low-income housing.

III. Objectives/Strategies

- Objective A: Reduce lead hazards in 75 housing units per year by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: Match EBL data with Memphis Housing Authority Section 8 Program quarterly and refer matched homes to the local housing project Lead Hazard Reduction Program. Refer houses of non-Memphis lead poisoned children to the Tennessee Lead Elimination Action Program (LEAP) for lead hazard reduction treatment when criteria are met.
 - c. Quality of output: Increase in houses having Lead Hazards Reduction Treatment.
 - d. Cost efficiency: More at risk children will be housed in lead safe properties.
 - e. Quality of resources: Agency: MSCHD (CLPPP Director) and LEAP

- Objective B: Educate 500 professionals per year about EPA's lead-based paint notification rule and recommended practices related to lead hazard containment/clean-up by June 30, 2009.
Performance measures:
 - a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: With TDH, TDEC, UTE, and Tennessee Division of Occupational Safety and Health Administration (TOSHA), coordinate an educational campaign for professionals from community agencies, government agencies, health care providers and health educators.
 - c. Quality of output: Provide lead hazard reduction education for property owners of rental property where lead poisoned children

reside. Notify painters and other re-modelers of issues of lead-based paint and monitor compliance with EPA's lead-based paint (LBP) notification rule.

- d. Cost efficiency: Increased compliance with recommended decontamination measures.
 - e. Quality of resources: TDH, TDEC, UTE, and (TOSHA).
- Objective C. Establish lead hazard regulation in Shelby County by June 30, 2009.
Performance measures:
- a. Impact: Childhood lead poisoning reduced/eliminated.
 - b. Quality of input: Regulation would: a) allow the Shelby County Health Department to have access to a work site while regulated work is conducted; and b) stipulate that lead hazard reductions, including abatement and subsequent cleanup in affected properties, must be performed according to the methods described in the regulations, whether the work is required by the health department or is undertaken voluntarily.
 - c. Quality of output: Regulation passed and enforced.
 - d. Cost efficiency: Increased compliance with recommended decontamination measures.
 - e. Quality of resources: Strength of the regulatory body.

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Tennessee Childhood Lead Poisoning Prevention Program Resources

Tennessee Department of Health

Medical Screening/Case Management
615-741-0355

Tennessee Lead Line/TDEC

Assessment, Abatement or Identification of Lead Sources
1-800-771-5323

University of Tennessee Extension

Environmental Health
865-974-8178

<http://fcs.tennessee.edu/healthsafety/environmentalhealth.htm>

Tennessee Department of Health

www2.state.tn.us/health/lead

Tennessee Lead Elimination Action Program

www.tennesseeleap.org

Tennessee Department of Housing and Urban Development

www.hud.gov/local/index.cfm?state=tn

Centers for Disease Control and Prevention (CDC)

www.cdc.gov/nceh/lead/lead.htm

Tennessee Department of Environment and Conservation

www.state.tn.us/environment/swm/leadpaint

Environmental Protection Agency (EPA)

www.epa.gov/lead

Lead-based Paint Firms, Inspectors, Risk Assessors

www.state.tn.us/environment/swm/leadpaint/listprof.php

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APPENDIX A

2003 Blood Lead Surveillance Data

(Reporting Laboratory Data Only)

1. Table 1a 2003 Children < 6 Years Old Screening Test Blood Lead Levels
2. Table 1b 2003 Children < 6 Years Old Lead Poisoning Blood Lead Levels
3. Table 2a 2003 Children < 6 Screening Tests by Age in Months
4. Table 2b 2003 Children < 6 Lead Poisoning by Age in Months
5. Table 3 2003 Lead Screening and Results by County
6. Table 4 2003 Lead Screening and Results by Laboratory
7. Figure 1: Number of Confirmed Cases of Childhood Lead Poisoning per County Identified in 2002-2003, (Total=492)

2003 Screening and Lead Poisoning in Tennessee Children

Table 1a

2003 Children < 6 Years Old Screening Test Blood Lead Levels

Blood Lead Level	Number	Percent	Cumulative Number	Cumulative Percent
BLL 0-9	50025	96.96	50025	96.96
BLL 10-14	1037	2.01	51062	98.97
BLL 15-19	318	0.62	51380	99.58
BLL 20-24	101	0.20	51481	99.78
BLL 25-44	90	0.17	51571	99.95
BLL 45-69	24	0.05	51595	100

Table 1b

2003 Children < 6 Years Old Lead Poisoning Blood Lead Levels

Blood Lead Level	Number	Percent	Cumulative Number	Cumulative Percent
BLL 0-9	0	0	0	0.00
BLL 10-14	116	58.29	116	58.29
BLL 15-19	54	27.14	170	85.43
BLL 20-24	19	9.54	189	94.97
BLL 25-44	10	5.03	199	100.00
BLL 45-69	0	0	199	100.00

Table 2a

2003 Children < 6 Screening Tests by Age in Months

Age in Months	Number	Percent	Cumulative Number	Cumulative Percent
0-11	7255	14.06	7255	14.06
12--35	25114	48.68	32369	62.74
36-72	19226	37.26	51595	100

Table 2b

2003 Children < 6 Lead Poisoning by Age in Months

Age in Months	Number	Percent	Cumulative Number	Cumulative Percent
0-11	20	10.05	20	10.06
12--35	104	52.26	124	62.32
36-72	75	37.68	199	100

Table 3
2003 Lead Screening and Results by County

County	Screening Tests	Positive Screening Tests	Nonconfirmed Positive	Confirmed Positive	Confirmed Venous	Confirmed 2+Caps≤12 wks.	Confirmed 2+Caps>12 wks.	False Positive 1 pos. test, 1 neg. test
Anderson	161	3	2					1
Bedford	125	17	7	8	6		2	2
Benton	20	1		1	1			
Bledsoe	47	5	3					2
Blount	258	10	4	1	1			5
Bradley	120	3	1	1		1		1
Campbell	241	6	1	1	1			4
Cannon	15							
Carroll	65	2	1	1	1			
Carter	38	4	3					1
Cheatham	77	3	2					1
Chester	28	1						1
Claiborne	192	1						1
Clay	14							
Cocke	83	1						1
Coffee	138	7	7					
Crockett	71	2						2
Cumberland	71	3	1					2
Davidson	1666	42	15	17	15	2		10
Decatur	34			0				
Dekalb	149	3		2	2			1
Dickson	91	3	1	1		1		1
Dyer	335	12	5	5	3	2		2
Fayette	48	1						1
Fentress	59	1	1					
Franklin	120	2	2					
Gibson	85	8	3	4		2	2	1
Giles	73	2	2					
Grainger	72	4	3					1
Greene	202	5	3	2	2			
Grundy	56	3	3					
Hamblen	261	19	15	1	1			3
Hamilton	1050	31	11	8	2	6		12
Hancock	24	1	1					
Hardeman	92	9	3	6	1	5		
Hardin	74	4	3					1
Hawkins	62	5	1	2	2			2
Haywood	144	7	3	2		2		2
Henderson	113	1						1
Henry	31							
Hickman	40	1	1					
Houston	10							
Humphreys	56	3	1	1		1		1
Jackson	14							
Jefferson	33	1	1					

Table 3
2003 Lead Screening and Results by County

County	Screening Tests	Positive Screening Tests	Nonconfirmed Positive	Confirmed Positive	Confirmed Venous	Confirmed 2+Caps≤12 wks.	Confirmed 2+Caps>12 wks.	False Positive 1 pos. test, 1 neg. test
Johnson	15	1	1					
Knox	717	16	5	4	4			7
Lake	64	3	1	2	1	1		
Lauderdale	220	13	10	2		2		1
Lawrence	157	5	2	2	2			1
Lewis	34	1	1					
Lincoln	70	3	2	1	1			
Loudon	160	8	2	3	3			3
Macon	34	3	1					2
Madison	92	5	1	1	1			3
Marion	71	4	3					1
Marshall	66	10	6	2	1		1	2
Maury	182	9	3	1	1			5
McMinn	104	3	2	1	1			
McNairy	116	4		2	1	1		2
Meigs	39							
Monroe	167	8	2	1			1	5
Montgomery	578	15	9	2	2			4
Moore	5							
Morgan	146	2	1					1
Obion	207	6	1	5		4	1	
Overton	55	4	2					2
Perry	26	1		1	1			
Pickett	25							
Polk	18	1		1	1			
Putnam	139	15	12					3
Rhea	135	2	1					1
Roane	353	3						3
Robertson	179	13	9					4
Rutherford	295	8	2	3	1	1	1	3
Scott	273	14	5	1		1		8
Sequatchie	41	1	1					
Sevier	68	4	3					1
Shelby	13815	444	139	67	62	3	2	238
Smith	64	2	1	1	1			
Stewart	30	3	2	1	1			
Sullivan	388	27	9	10	9	1		8
Sumner	282	8	7	1	1			
Tipton	324	2	2					
Trousdale	15							
Unicoi	31	4	2	1	1			1
Union	37	1		1	1			
Van Buren	9							
Warren	102	6	4	1		1		1
Washington	120	18	9	7	5	2		2

Table 3
2003 Lead Screening and Results by County

County	Screening Tests	Positive Screening Tests	Nonconfirmed Positive	Confirmed Positive	Confirmed Venous	Confirmed 2+Caps≤12 wks.	Confirmed 2+Caps>12 wks.	False Positive 1 pos. test, 1 neg. test
Wayne	16	1		1	1			
Weakly	154	5	5					
White	96	3	2					1
Williamson	144	5		3	2		1	2
Wilson	377	13	4	4	3	1		5
No county info	23982	369	231	2	2		0	136
TOTAL	51595	1333	615	199	148	40	11	519

Table 4
2003 Lead Screening and Results by Laboratory

Laboratory	Screening Tests	Positive Screening Tests	Non confirmed Positive	Confirmed Positive	Confirmed Venous	Confirmed 2+Caps≤1 2 wks.	Confirmed 2+Caps>1 2 wks.	False Positive 1 pos. test, 1 neg. test
ACL Industrial Toxicology	26	6	6	0	0	0	0	0
American Medical Lab	176	10	4	3	1	0	2	3
ARUP Laboratories	2186	31	11	9	8	1	0	11
Brooke Army Medical Cent	1	0	0	5	0	0	0	0
Holston Medical Group	198	10	4	7	5	0	0	1
Jackson Madison General	75	60	49	17	1	6	0	4
Lab One	1024	130	93	47	13	4	0	20
LabCorp	10383	328	153	13	21	21	5	128
LabOne, Inc.	3360	88	51	0	12	1	0	24
Mayo Medical Laboratories	466	4	3	2	0	0	0	1
Medtox Laboratories Inc.	1875	16	9	0	1	0	1	5
Memphis Health Center	272	8	4	4	0	0	0	4
Memphis Pathology	4869	51	25	2	2	3	1	20
Memphis Shelby County HD	12060	398	125	53	52	0	1	220
Quest Diagnostics - Atla	3576	49	14	9	8	1	0	26
Quest Diagnostics - Nash	6170	77	29	16	15	0	1	32
Quest Diagnostics - Nich	112	2	2	0	0	0	0	0
Quest Diagnostics Nichol	1148	21	13	3	1	2	0	5
Smithkline Beecham Quest	545	8	5	1	0	1	0	2
Specialty Laboratories,	618	20	6	6	6	0	0	8
Unknown Lab	2455	16	9	2	2	0	0	5
TOTAL	51595	1333	615	197	148	40	11	519

APPENDIX B

Census and Housing Data

1. Table 1. Tennessee Counties where children are at highest risk of lead poisoning
2. Table 2. Number of children under age 6 at risk of lead poisoning based on census and housing characteristics of their county of residence
3. Table 3. Screening of children under age 6 for lead poisoning in Tennessee
4. Table 4. In Tennessee, 1.9% of pre-1950s housing units include poor Black children under the age of 6, and 4.0% of pre-1950s housing units include poor children under age 6 who are not Black
5. Table 5. The average number of requested EBLL Risk Assessment Inspections in 2003 is significantly higher in metropolitan areas than in non-metropolitan areas.
6. Table 6. The average number of confirmed EBLs in 2003 is significantly higher in non-metropolitan and metropolitan counties with higher numbers of pre-1950s housing than in smaller non-metropolitan areas.
7. Table 7: Lead-based Paint Probability in Tennessee Housing
8. Figure 2: Counties where children are at risk for lead poisoning
9. Figure 3: Number of Pre-1950 Housing Units

Table 1. Tennessee Counties where children are at highest risk of lead poisoning

Region and County	Housing built before 1950		Children under five in poverty		Low income housing units	
	%	N	%	N	%	N
Non-Metropolitan Counties						
East Tennessee						
Anderson	28%	8,200				
Blount		7,100				4,500
Campbell			51%			
Claiborne					27%	
Cocke			49%		28%	
Scott			47%		30%	
Union			45%			
Mid-Cumberland						
Montgomery				2,600		4,700
Rutherford				1,600		5,400
Northeast						
Carter	25%	5,500				
Hancock			59%		41%	
Johnson			51%		30%	
Unicoi	28%					
Sullivan		12,000		2,300		8,400
Washington		7,500		1,600		6,100
South Central						
Giles	25%					
Maury	47%					
Southeast						
Bradley				1,300		
Grundy				1,300		
McMinn	54%				27%	
Upper Cumberland						
Fentress			55%		34%	
Pickett			47%		27%	
Smith	23%					
West Tennessee						
Crockett	25%					
Haywood			49%		28%	
Lake	24%		50%		30%	
Metropolitan Counties						
Davidson		36,000		9,400		27,000
Hamilton		26,000		5,200		16,000
Knox		28,000		5,600		21,000
Madison	64%	5,700		1,900		5,600

Source: Scorecard.org and U.S. Census Bureau

Note: Shelby County was not included when these data were collected.

Table 2. Number of children under age 6 at risk of lead poisoning based on census and housing characteristics of their county of residence

Region and County	Age in Months			Total
	0 to 11	12 to 35	36 to 71	
Non-Metropolitan				
East Tennessee				
Anderson	866	1,537	2,484	4,887
Blount	1,254	2,422	3,925	7,601
Campbell	528	947	1,367	2,842
Claiborne	287	612	1,181	2,080
Cocke	373	920	1,087	2,380
Scott	282	682	732	1,696
Union	155	504	790	1,449
Mid-Cumberland				
Montgomery	2,285	4,464	6,546	13,295
Rutherford	3,089	5,119	8,163	16,371
Northeast				
Carter	625	1,266	1,785	3,676
Hancock	75	129	238	442
Johnson	150	343	535	1,028
Unicoi	178	449	551	1,178
Sullivan	1,615	3,135	4,750	9,500
Washington	1,215	2,519	4,000	7,734
South Central				
Giles	378	690	1,061	2,129
Maury	662	1,333	1,797	3,792
Southeast				
Bradley	1,256	2,166	3,409	6,831
Grundy	145	398	636	1,179
McMinn	1,054	1,841	2,895	5,790
Upper Cumberland				
Fentress	152	441	628	1,221
Pickett	44	116	181	341
Smith	210	483	708	1,401
West Tennessee				
Crockett	216	381	483	1,080
Haywood	231	629	945	1,805
Lake	82	160	229	471
Metropolitan				
Davidson	7,864	15,664	21,094	44,622
Hamilton	3,472	7,243	11,764	22,479
Knox	4,340	9,440	14,190	27,970
Madison	1,290	2,482	3,859	7,631
Shelby	13,904	27,319	40,751	81,974
Total	48,277	95,834	142,764	286,875

Table 3. Screening of children under age 6 for lead poisoning in Tennessee

Region and County	Number of children under age 6	Number screened	Percent screened
Non-Metropolitan counties where children are at risk			
East Tennessee			
Anderson	4,887	161	3.29
Blount	7,601	257	3.38
Campbell	2,842	240	8.44
Claiborne	2,080	192	9.23
Cocke	2,380	83	3.49
Scott	1,696	273	16.10
Union	1,449	37	2.55
Mid-Cumberland			
Montgomery	13,295	578	4.35
Rutherford	16,371	291	1.78
Northeast			
Carter	3,676	38	1.03
Hancock	442	24	5.43
Johnson	1,028	15	1.46
Unicoi	1,178	30	2.55
Sullivan	9,500	387	4.07
Washington	7,734	117	1.51
South Central			
Giles	2,129	73	3.43
Maury	3,792	180	4.75
Southeast			
Bradley	6,831	117	1.71
Grundy	1,179	56	4.75
McMinn	5,790	101	1.74
Upper Cumberland			
Fentress	1,221	59	4.83
Pickett	341	25	7.33
Smith	1,401	64	4.57
West Tennessee			
Crockett	1,080	71	6.57
Haywood	1,805	144	7.98
Lake	471	63	13.38
Total Non-Metropolitan	102,199	3,676	3.60
Metropolitan Counties			
Davidson	44,622	1,648	3.69
Hamilton	22,479	1,041	4.63
Knox	27,970	717	2.56
Madison	7,631	92	1.21
Shelby	81,974	13,807	16.84
Total Metropolitan	184,676	17,305	9.37
Non-Metropolitan counties where children are at less risk of lead poisoning: Total			
	162,391	6,911	4.26
County of screened child not known			
	421,761	24,091	5.71 *

* The denominator is the population under age 6 in Tennessee in 2000 (449,266) minus the number of children screened whose county is known (27,505)

Table 4. In Tennessee, 1.9% of pre-1950s housing units include poor Black children under the age of 6, and 4.0% of pre-1950s housing units include poor children under age 6 who are not Black

Race	Percent of poverty level in 2000	Age group living in housing unit*	Year housing unit built			Subtotal: Housing Units
			Before 1950	1950 - 1979	After 1979	
Not Black or African-American	1 to 200%	One or more children under age 6	12,449	39,253	51,032	102,734
			4.0%	4.0%	5.5%	4.6%
		One or more children age 6 to 17	20,846	62,421	73,480	156,747
			6.6%	6.3%	7.9%	7.0%
		One or more adults age 18+	109,903	270,585	220,672	601,160
			35.0%	27.3%	23.8%	26.9%
	Above 200%	One or more children under age 6	14,962	50,352	100,168	165,482
			4.8%	5.1%	10.8%	7.4%
		One or more children age 6 to 17	30,922	109,981	178,113	319,016
			9.9%	11.1%	19.2%	14.3%
		One or more adults age 18+	152,176	522,729	607,046	1,281,951
			48.5%	52.7%	65.4%	57.4%
Black or African-American	1 to 200%	One or more children under age 6	6,023	28,061	14,148	48,232
			1.9%	2.8%	1.5%	2.2%
		One or more children age 6 to 17	10,289	42,184	20,051	72,524
			3.3%	4.3%	2.2%	3.2%
		One or more adults age 18+	30,604	104,683	42,126	177,413
			9.7%	10.6%	4.5%	7.9%

Race	Percent of poverty level in 2000	Age group living in housing unit*	Year housing unit built	Year housing unit built	Year housing unit built	Subtotal: Housing Units
			Before 1950	1950 - 1979	After 1979	
	Above 200%	One or more children under age 6	1,776	12,594	11,209	25,579
			0.6%	1.3%	1.2%	1.1%
		One or more children age 6 to 17	4,385	30,743	22,986	58,114
			1.4%	3.1%	2.5%	2.6%
		One or more adults age 18+	21,242	93,033	57,645	171,920
			6.8%	9.4%	6.2%	7.7%
		TOTAL HOUSING UNITS	313,925	991,044	927,621	2,232,590
Source: 1% Public Use Microdata Sample, 2000 Census of Population and Housing, Tennessee						
Population data were aggregated by housing unit, then weighted by the housing unit weight.						
Vacant housing units were excluded from this analysis. Units with a head of household under age 18 were included.						

Table 5. The average number of requested EBLL Risk Assessment Inspections in 2003 is significantly* higher in metropolitan areas than in non-metropolitan areas.

County Risk Status and Metropolitan Status	N	Mean	Standard Deviation	Standard Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Lower risk non-metro counties	64	0.44	0.71	0.14	0.15	0.72
Higher risk non-metro counties	25	0.68	1.11	0.23	0.23	1.13
Metropolitan counties, excluding Shelby County	5	4.40 *	3.78	0.51	3.39	5.41

* $F(2, 91) = 28.00, p < .001$ with Levene's Test $F(2, 91) = 31.23, p < .001$.

Eta squared = .381

The means for lower and higher risk non-metro counties do not differ, but both differ significantly ($p < .001$) from the mean for metro counties.

Table 6. The average number of confirmed EBLs in 2003 is significantly* higher in non-metropolitan and metropolitan counties with higher numbers of pre-1950s housing than in smaller non-metropolitan areas.

Number of Pre-1950 housing	N	Mean	Standard Deviation	Standard Error	95% Confidence Interval	
					Lower Bound	Upper Bound
200 - 950	21	0.33	0.58	0.39	-0.44	1.10
951 - 2,650	45	0.82	1.54	0.27	0.30	1.35
2,651 - 8,300**	24	1.96 *	1.92	0.36	1.24	2.68
12,000 - 36,000: Metro counties excluding Shelby County	4	9.75 *	5.44	0.89	7.98	11.52

* $F(3, 90) = 34.24, p < .001$ with Levene's Test $F(3, 90) = 9.93, p < .001$

Eta squared = .533

** Includes one metro county (Madison) with 5,700 pre-1950s housing

Table 7: Lead-based Paint Probability in Tennessee Housing

Region	Number of housing units built prior to 1978	Percent of Housing units Built prior to 1978	Total occupied Housing units	Estimated Occupied Housing Units With LBP	Percent of Estimated Occupied Housing Units with LBP
East	598,608	77.05 %	710,397	383,227	50.61 %
Middle	498,810	71.61 %	635,720	323,962	46.51 %
West	438,674	79.38 %	507,608	288,610	52.23 %
State	1,536,092	75.82 %	1,853,725	1,005,799	49.64 %

Figure 2:

Counties where children are at risk for lead poisoning



Figure 3:

NUMBER OF PRE-1950 HOUSING UNITS



APPENDIX C
Health Education and Outreach

Childhood Lead Poisoning Prevention Program

Quarterly Report April-June 2003

Quarterly Report for the state of TN Health Departments

- 1) 76 Number of times presented an educational display promoting lead screenings (at a health fair, career fair, school, or any other public place or meeting).
- 2) 44 Number of times presented an educational program (promoting lead screening) to a community group (parents, caregivers or general public).
- 3) 740 Number of professionals contacted to promote lead poisoning awareness and education (Providing educational information and/or resource materials to health care providers/teachers/social workers or professionals from other public and private agencies such as childcare).
- 4) 77 Number of times coordinated with TDEC, LEAP (MTSU) and/or any housing agency in your area to find resources for lead hazard control.
- 5) Special initiatives to promote lead screening:
 - Sullivan Co. - The Sesame Street video was presented to all Sullivan Co. Head Start classes.
 - East Tn- Literature taken to dr's office and daycare centers
 - Hamilton Co. - partnered with Safe and Sound (an agency that provides parenting classes) to provide lead education to Hispanic expectant mothers
 - Memphis- developed a daycare/Head Start screening and outreach/education program. Partnered with WIC and EPSD&T
 - West Tn. - T-shirts, bibs and coloring books are be given to children who receive screenings as a reward.

Grant Year July1, 2003 – June 30, 2004

Child Care Facility	# Of Workers Trained
August	
St. Luke Christian Day Care Center	7
Christian Chapel Learning Center	8
LUV's and HUGS Day Care Center	9
Ellis Grove Learning Center	7
Thesselonian Day Care Center	8
September	
Joshua's Learning Tree	5
October	
Healing Hands Day Care	9
St. Patricks (Children)	50
Bright Start Head Start	28
St. William Day Care	5
November	
Healing Hands Day Care	6
Neighborhood House Day Care	15
Mitchell Head Start	27
YMCA Head Start	30
December	
Other Mother's Day Care Center	10
Joshua's Learning Center	7
January	
Porter Leath	19
Alpha Christian Academy	8
February	
Learn and Play Day Care	19
First Baptist Day Care	11
March	
Memphis Children Enrichment Center II	10
First Baptist Learning Center (Children)	55
University of Memphis Child Dev. Center	8
Lemoyne Owen Contractor Sup. Coarse	12
Horton Gardens Day Care Center	3
New Beginnings Day Care Center	8

April

Kids Kastle	9
Kings Kids Day Care	4
Children's World	14
Kings Kids I	4
American Way Head Start	40

May

First Baptist Day Care (Children)	22
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June

Children's World	11
Luv's and Hugs (Children)	40
Cuddles Day Care (Children)	60

TOTALS – Workers Trained = 361
Children Trained = 227

Grant Year July1, 2003 – June 30, 2004

Child Care Facility/Health Fair	# Of Children Tested
All About Love DC	20
American Way Head Start	43
Arlington Head Start	26
Babbies-R-Us Day Care	0
Bartlett Head Start	53
Berclair Elementary Health Fair	0
Bethel Presbyterian Church Health Fair	2
Bickford Head Start	58
Bright Start Head Start	44
Brunswick Head Start	62
Church of God and Christ Health Fair	15
Church of Christ Health Fair	4
Christian Chapel Day Care Center	15
Cuddles Day Care Center	27
DHS Heath Fair	7
Delano Head Start	67
Destiny Prep School	22
Douglas Head Start	143
Disney Distribution Health Fair	0
Early Childhood Health Fair	0
Ellis Grove Learning Center	15
First Baptist Day Care	26
Gaston Head Start	43
Georgian Hills Head Start	112
Glorious Future Head Start	38
Hanley Head Start	104
Hillview Head Start	61
Hispanic Health Fair	7
Highland Church of Christ Health Fair	13
Hollywood Head Start	99
Horton Gardens Head Start	65
Immunization Health Fair Screening (2)	51
Joyful Noise Day Care Center	10
Kid Kreation Day Care Center	7
Lakeland Head Start	30

Child Care Facility/Health Fair	# Of Children Tested
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Les Passe Head Start	188
Les Passe Health Fair	4
Luv's and Hugs Day Care Center	38
MHA Health Fair	0
Martin Luther King Head Start	84
Meadows Head Start	19
Memphis Health Center Health Fair	8
Mitchell Head Start	83
Mitchell Health Fair	0
New Salem Health Fair	0
Park Commission Health Fair	0
Pleasant View Day Care Center	10
Porter Leath Head Start (American Way)	195
Primary Prep Head Start	51
Public Works Health Fair	0
Riverview Community Center Health Fair	17
Riverview/Kansas Head Start	24
Safe Kids Coalition Health Fair	0
Smith & Nephew Health Fair	0
South Park Health Fair	0
Spirit Soul and Body Day Care "SSB"	6
St. Augustine Day Care	18
St. Andrew Health Fair	3
St. Joseph Day Care	18
St. Luke Day Care	13
St. Patrick Day	35
St. Peter Head Start	
St. William Head Start	86
Sycamore Road Head Start	34
Thesselonian Day Care Center	10
YWCA Head Start	91

TOTALS – Day Care Centers – 8
 Head Start Facilities – 25
 Health Fairs – 24

Children Screened = 2424

APPENDIX D

Case Management/Environmental Investigations

- 1. Proposed Lead-Based Paint Regulations Draft**
- 2. Case Management/Environmental Investigation Reports**

CLPPP Case Management Report (Excluding Memphis)

Report Date: June 2004

Total Case Load: 713

Active Cases = 310 Closed Cases = 403

High Elevated Blood Lead Level (EBL) = $\geq 20 \mu\text{g/dl}$

Total Cases = 30

Cases with current High EBL = 27

Cases remaining at high levels after medical management = 3

Medium EBL = 15-19 $\mu\text{g/dl}$

Total Cases = 59

Cases with current medium levels = 45

Cases remaining at medium levels after medical management = 14

Low EBL = 10-14 $\mu\text{g/dl}$

Total Cases = 221

Cases with current low levels = 178

Cases at low levels after medical management = 43

Closed Cases

Total Cases = 403

Total false positive Cases = 203

Total Cases < 10 after medical management = 140

Total Cases closed administratively = 60 (problems with follow up care)

Environmental Investigations

Total to date = 47

Total pending = 7

Total with second requests = 4

LEAP (Lead Elimination Action Plan)

Total Cases Referred to date per LEAP criteria = 177

Total Cases Referred after Environmental Investigations = 35

* LEAP Criteria = Elevated Blood Lead Levels $\geq 10 \mu\text{g/dl}$ - $19 \mu\text{g/dl}$

2004 CLPPP Monthly Case Management Monthly Report
(Excluding Memphis)

Active Cases	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High EBL Cases	65	60	53	50	46	30						
Cases with High EBL after medical management	9	8	7	7	7	3						
Medium EBL Cases	26	20	25	22	30	59						
Cases with Medium EBL after medical management	22	29	28	18	16	13						
Low EBL	117	128	141	162	177	221						
Cases with Low EBL after medical management	25	34	38	42	42	43						
Total Active Cases	264	279	292	301	318	310						

Closed Cases	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
XA- age	0	0	7	6	15	22						
XA- no follow up	17	19	22	20	27	38						
False Positives	124	135	145	162	168	203						
Cases $\leq 10\mu\text{g/dl}$	87	92	100	110	119	140						
Total Closed Cases	228	246	274	298	329	403						

High EBL = Elevated Blood Lead Levels $\geq 20\mu\text{g/dl}$
 Medium EBL= Elevated Blood Lead Levels 15-19 $\mu\text{g/dl}$
 Low EBL= Elevated Blood Lead Levels 10-14 $\mu\text{g/dl}$
 XA= Cases closed administratively due to age or inability to follow cases.
 * This information is based on the 2002 – current data

FY 2004 Memphis CLPPP Report

July 1, 2003 – June 30, 2004

PbB Level	Venous	Capillary	Unknown	Total
> 45 µg/dl	0	3	1	4
20 – 44 µg/dl	14	11	13	38
15 – 19 µg/dl	22	60	13	95
10 – 14 µg/dl	72	199	32	303
0 – 9 µg/dl	1,877	8,888	6,070	16,835
No Result	12	98	137	247
Total	1,997	9,259	6,266	17,522

Total Case Load: 440

- High Cases (≥ 20) 42
- Med Cases (15-19) 95
- Low Cases (10-14) 303

Environmental Investigations Performed: 80

- TDEC
 - Referred 23
 - Completed 5
- City/County HUD Grant
 - Referred 619
 - Completed 75

Properties receiving Lead Hazard Treatments: 94

Proposed Lead-Based Paint Draft Regulation: Shelby County

This law applies to persons, including assessing agencies, who do regulated lead work in or for affected property. An individual must obtain the appropriate Tennessee license before doing regulated work. In general, a person must allow the Shelby County Health Department to have access to a work site while the person performs regulated work. Lead hazard reductions, including abatement and subsequent cleanup in affected properties, must be performed according to the methods described in the regulations, whether the work is required by the health department or is undertaken voluntarily.

The regulations will include methods for lead hazard reduction including instructions for disturbing bare soil, interior and exterior paint. These are the prohibited lead hazard work practices listed:

A clearance inspection must be performed by an assessing agency after lead hazard reduction ordered by the assessing agency. The ordered work is successfully completed after analysis of samples demonstrates that the standards in part (Standard in Lead in paint, dust, soil, and drinking water) are not exceeded. As for voluntary lead work, clearance inspections for voluntary lead hazard reduction must be performed as described in the regulations by a Tennessee State licensed lead risk assessor or by a lead inspector, except that a clearance inspection is not required if a property owner performs voluntary lead hazard reduction in the owner's property.

All rules, orders, stipulation agreements, settlements, compliance agreements, licenses, registrations, certificates, and permits adopted or issued by the department or under any law now in force or later enacted for the preservation of public health may, in a addition to provisions in other statutes, be enforced. The Health Department may issue correction orders that require a person to correct a violation of the statutes, rules, and other actions. If the person believes that the information contained in the correction order is in error, the person may ask the Health Department to reconsider the parts of the order that alleged to be in error. If the Health Department determines that the violation has been corrected or the person to whom the order was issued has developed a corrective, acceptable plan, the penalty must be forgiven. If a person fails to pay a penalty owed, the Health Department has grounds to recommend to the State of Tennessee to revoke or refuse to renew a permit issued by the State.