# Minnesota's Lead Poisoning Prevention Programs

# Biennial Report to the Legislature

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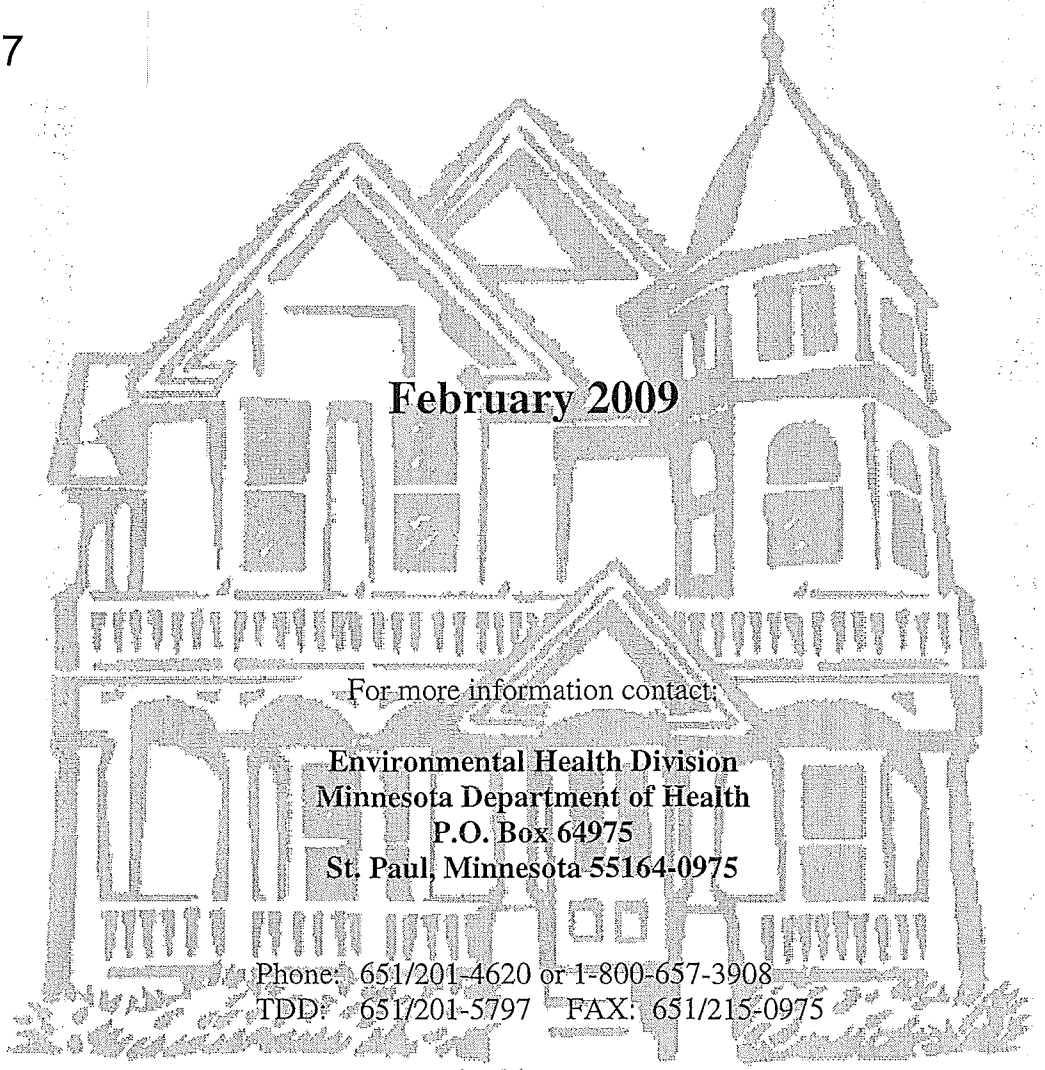

**February 2009**

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**Minnesota Department of Health - Lead Poisoning Prevention Programs**
**Biennial Report to the Legislature, February 2009**

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## Executive Summary

The State of Minnesota has consistently played a leading role in identifying and addressing public health issues related to lead exposure. The lead program at the Minnesota Department of Health (MDH) is positioned to maintain that leadership role and protect the health and well being of the citizens of Minnesota from the potentially devastating effects of exposure to lead. The current report documents activities conducted by MDH between January 2007 and January 2009. Previous reports were prepared for the period of January 2001 to January 2007. Additional background information on lead issues and a comprehensive overview of basic roles and procedures for the MDH Lead Program were presented in the 2001 legislative report and are not reproduced in this document.

Lead poisoning prevention partners have been actively involved in collaborative lead reduction strategies over the past several years. The State of Minnesota Childhood Lead Poisoning Elimination Plan (Elimination Plan, **Appendix A**) is the result of one such effort. The Elimination Plan was developed in 2004 and adopted a goal of creating a lead-safe Minnesota where no child would have elevated blood lead levels (EBLLs) by the year 2010. Elimination of EBLLs was defined as zero percent of at-risk children who are less than 72 months of age with blood lead levels greater than or equal to 10 micrograms of lead per deciliter of whole blood (μg/dL). The Elimination Plan recommends a collaborative, housing-based approach to promote primary prevention of lead exposure. The Elimination Plan is in concert with federal goals of eliminating childhood lead poisoning by 2010, and was updated in 2006 and 2008.

MDH continued to collect information on all lead tests performed on Minnesota residents. The Blood Lead Information System (BLIS) database is maintained in an Oracle platform for the highest possible data security and to provide for interoperability with other MDH programs. During 2007 and 2008 there was once again a significant increase in the number of blood lead tests performed, reflecting a growing awareness of the need to check for potential exposure to lead. The number of EBLL cases continued to decrease, which is consistent with national trends. Several key studies were performed using data from BLIS, including an examination of lead testing in refugee children and children enrolled in Medicaid. The state lead guidelines for screening, case management, and clinical treatment were evaluated and updated. The State Case Monitor, a public health nurse in the MDH Lead Program, continued to guide case management of elevated lead levels by local public health agencies. Collaborative groups were maintained to help foster a cooperative approach to addressing the multi-faceted lead problem.

MDH lead program compliance staff have continued their efforts in compliance assistance, compliance monitoring and enforcement activities. This is accomplished by promoting education and compliance training, licensing, and registering lead professionals and certifying firms performing regulated lead work, approving training courses, and conducting compliance monitoring and enforcement activities. The main objective of MDH's lead compliance program is to make lead removal and assessment services available that serve and protect public health.

All members of the lead program staff share responsibility for educating and communicating effectively about the risks posed by lead. They carry out these activities in all areas of the state where cities of the first class have not assumed responsibility for lead inspection and hazard reduction.

Although reported EBLLs are declining nationally and in Minnesota, the state needs to continue to effectively reach the remaining at-risk populations. High-risk populations tend to be diverse, under-served, highly mobile, and often face barriers that impede effective communication. Fully addressing these issues will require continued funding support from the State.

Future activities will focus on maintaining current lead program capacity, addressing gaps in our current knowledge and capacity, and assuring effective use of available funds. These activities will include:

- Working with the Centers for Disease Control and Prevention (CDC) and other agency partners on targeted efforts to reduce exposure to lead, with a special emphasis on addressing the needs of diverse and currently under-served populations and on implementing primary prevention strategies;
- Continuing examination of trends in lead poisoning in the Minnesota childhood Medicaid population and the development of collaborative efforts to reduce exposure and fully use available resources;
- Continuing to offer outreach and education to general rehabilitation contractors working on residential projects; educate them about the hazards associated with working with lead based paint and recent developments in federal rules and regulations;
- Working with health plans to promote awareness of lead, ensure appropriate delivery of services to at-risk children, and sharing information to accurately identify areas of high risk for lead exposure across the state;
- Working collaboratively with other disease surveillance programs at MDH to help ensure that reporting systems are efficient, secure, complete, accurate, and compatible with national databases;
- Working to integrate lead poisoning prevention activities into the developing statewide Healthy Homes program.
- Continuing efforts to maintain the high quality of data in the surveillance database through ongoing review of data entry procedures, targeted studies of reporting from laboratories and clinics, and distribution of data reporting outcomes to partners;
- Increased educational outreach, especially to pregnant women and women of childbearing age and other at-risk populations;
- Continuing to evaluate compliance monitoring and enforcement efforts to ensure that a properly trained and skilled lead workforce exists in Minnesota;
- Continuing to provide education tools and materials to reduce lead poisoning cases among children and adults; and
- Continuing to provide compliance assistance opportunities and presentations to the public and the regulated community.

## Introduction

This biennial report addressing state lead poisoning prevention activities is required by Minnesota Statutes (MS), section 144.9509 subd. 3, which states:

> *The commissioner shall examine compliance with Minnesota's existing lead standards and rules and report to the legislature biennially, beginning February 15, 1997, including an evaluation of current lead program activities by the state and boards of health, the need for any additional enforcement procedures, recommendations on developing a method to enforce compliance with lead standards, and cost estimates of any proposed enforcement procedure. The report shall also include a geographic analysis of all blood lead assays showing incidence data and environmental analyses reported or collected by the commissioner.*

A comprehensive overview of the Minnesota Department of Health (MDH) Lead Program was presented in the report prepared for the Legislature dated February 2001. The complete 2001 report is available at the MDH website at: www.health.state.mn.us/divs/eh/lead. Update reports were prepared in January 2003 for the period of January 2001 to January 2003, January 2005 for the period of January 2003 to January 2005, and January 2007 for the period of January 2005 to January 2007. Rather than duplicate the information in those documents, the current report will only present information and updates on activities occurring during January 2007 to January 2009. Due to the time lag involved in collecting, analyzing, and reporting data, some information prior to 2007 may also be presented. Another complete report will be prepared in 2011, and will report on the progress of the Childhood Lead Poisoning Elimination Plan (described below).

This report cost $3,000 to prepare, including staff time, printing, and distribution costs. Information used to compile this report was obtained from MDH files, including both public and private data sources. The complete 2009 report may also be found at the MDH website at: www.health.state.mn.us/divs/eh/lead under the "Publications and Reports" subheading, and is available upon request.

## Current State Lead Programs

Lead poisoning prevention activities at MDH are housed within the Division of Environmental Health. The Environmental Impacts Analysis Unit, in the Environmental Surveillance and Assessment Section, is responsible for lead-related surveillance activities and implements the Centers for Disease Control and Prevention (CDC)-funded Childhood Lead Poisoning Prevention program (CLPPP). The Asbestos/Lead Compliance Unit, in the Indoor Environments and Radiation Section, is responsible for assuring compliance with state rules and statutes dealing with lead hazards. Other state agencies dealing with lead or blood lead testing include the Pollution Control Agency, Department of Agriculture, Occupational Safety and Health Administration, Department of Natural Resources, Housing Finance Agency, Department of Human Services, and Department of Employment and Economic Development. Cities of the first class and counties also have duties with respect to lead risk assessment and case management.

MDH strives to provide the best possible service to Minnesota families whose children have possible lead-related health problems. MDH also provides needed information about lead issues to county-level health officials, physicians, organized health care providers, and other professionals responsible for preventing and managing lead risks in the most effective and efficient manner possible.

## I. Surveillance Activities

MDH maintains a blood lead surveillance system for the purpose of monitoring trends in blood lead levels in adults and children in Minnesota. Whenever Minnesota residents are tested for blood lead, analyzing laboratories submit the results to the MDH lead program, as mandated by Minnesota Statute 144.9502. The results are entered either manually or electronically into the Blood Lead Information System (BLIS) database. BLIS is maintained in an Oracle platform, which allows for high data security, and is compatible with other current and projected state agency systems for data transfer. As of January 21, 2009 the blood lead database contained 1,094,942 records of blood lead test results from 727,831 individual Minnesota residents dating back to 1992. Blood lead data are used to help identify populations at risk for elevated blood lead levels (EBLLs), to help ensure that screening services are provided to groups identified as having the highest risk of lead poisoning and to ensure that environmental and medical follow up are provided to children with EBLLs.

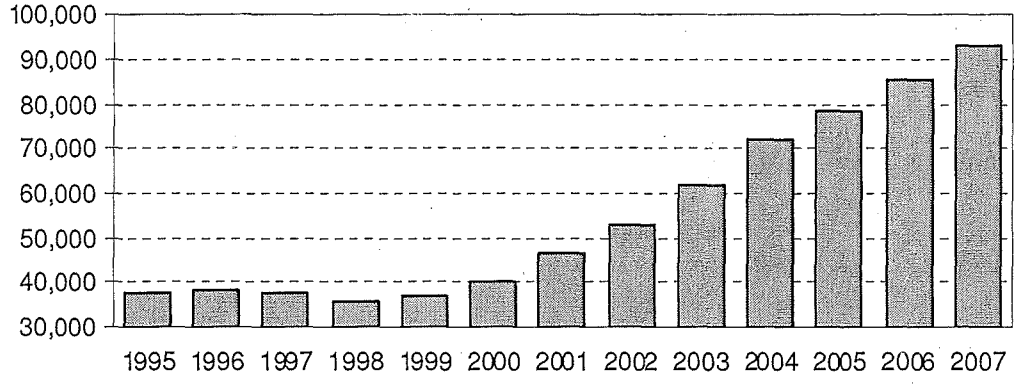
Specific conclusions cannot be drawn regarding the actual rates of lead poisoning in Minnesota based upon the data in BLIS. Since there is not universal testing among children across the state and testing is not conducted randomly, the tests reported to BLIS are not representative of the entire population of Minnesota. A direct comparison of numbers of children with EBLLs between Minnesota counties is not appropriate because the counties have different rates of testing. However, the data may be used to identify trends in screening practices from year to year, compare the total number of EBLLs reported to MDH over time, and characterize the population currently being screened. Section **I. Surveillance Activities** presents data on lead poisoning in children less than six years old and adults, an overview of projects targeted to at-risk populations, and MDH statewide lead guidance. Further surveillance data are available in the 2007 Surveillance Report (**Appendix B**). The 2008 Surveillance Report will not be available until June 2009 due to the time lag in reporting of blood lead tests for 2008.

### *A. Elevated Blood Lead Levels (EBLLs) in Minnesota*

#### Blood Lead Levels in Children

The number of blood lead tests reported statewide was fewest in 1998 and has been increasing since that year (Figure 1). Since not all Minnesota children have a high risk for lead exposure, targeted screening, rather than universal screening, is currently recommended for most areas of the state. The goal is to test all children at risk for exposure to lead. Therefore, because not all Minnesota children are exposed to lead risk factors, the optimal level of screening will be less than 100%.

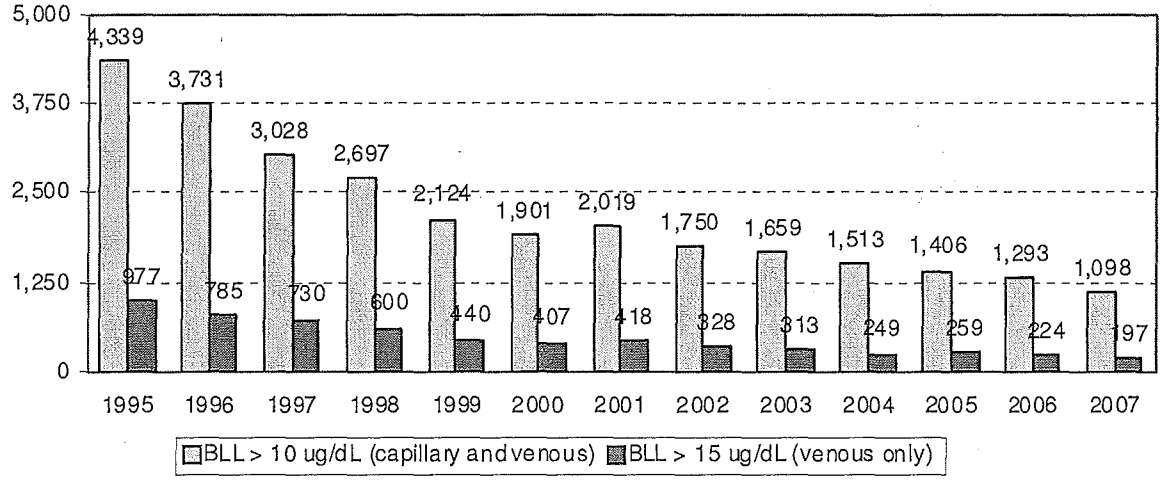
**Figure 1. Number of Children Tested**




Two types of blood specimens are used for childhood blood lead testing, capillary and venous. Capillary specimens are drawn from a finger or heel stick. Blood is pooled on the skin and either drawn into a glass capillary tube or dropped onto lead-free filter paper for collection. Capillary specimens are considered screening tests because they are prone to falsely high results due to surface contamination when the patient's hands are not properly washed with soap and water. Venous specimens are considered diagnostic tests because they are drawn directly from a vein into a collection device, thereby avoiding skin surface contamination.

The trends in the number of EBLL cases (e.g. tests greater than or equal to 10 µg/dL) in Minnesota children may be compared across years (Figure 2). The general downward trend shown in Figure 2 is consistent with national trends. Numbers are also shown for venous blood lead levels greater than or equal to 15 µg/dL, the level at which an environmental assessment is required to identify and mitigate lead exposure. Approximately 65% of the reports above 15 µg/dL in Minnesota come from Minneapolis and St. Paul, indicating that in specific areas of the state lead poisoning continues to be a major public health problem. For this reason, the MDH Childhood Blood Lead Screening Guidelines recommend universal testing in the cities of Minneapolis and St. Paul.

**Figure 2. Number of Children with Reported Elevated Blood Lead Levels**



While the rate of lead testing increased during the 1999 - 2007 period, the number of EBLL cases has slowly declined since 1995. Although these data are difficult to interpret due to many confounding factors, the downward trend for EBLLs may indicate that the amount of lead exposure is declining in Minnesota.

Rate of follow-up testing for children with EBLLs

MDH guidelines recommend follow-up blood lead tests for children with EBLLs. The period of time recommended for re-testing varies according to the initial blood level (see case management guidelines below), but the maximum time is 90 days for any child with a blood lead level of 10 µg/dL or greater. Of the 1,098 Minnesota children identified with EBLLs in 2007, 625 (60%) received a follow-up test. Of these, 479 (44% of the total children with EBLLs) were retested within 90 days of their initial EBLL. Working to improve this follow-up rate would best serve children with EBLLs by reducing and mitigating the effects of their lead exposure. Improving the follow-up rate will take the combined efforts of providers, case managers and the MDH Lead Program.

Blood Lead Levels in Adults

Minnesota's Adult Blood Lead Epidemiology and Surveillance (ABLES) program began identifying eligible adults on January 1, 1998. Lead sources are identified for all adults with venous blood lead levels of 25 µg/dL or greater in the surveillance system. Lead testing data reported to MDH for adults in Minnesota are presented in Table 1.

**Table 1: Minnesota Residents 18 Years or Older with a Reported Blood Lead Test**

| Year | # of Reports | # of Individuals | Range of Reported Results |
|---|---|---|---|
| **2006** | 9,494 | 8,393 | 0.0 to 73.0 µg/dL |
| **2007** | 9,827 | 8,668 | 0.0 to 82.0 µg/dL |

There were 156 adults with BLLs of 25 µg/dL or greater identified through the ABLES program in 2007, and there were 14 adults with reported levels greater than 40 µg/dL. Through clinic contacts and laboratory reports, information on occupation was obtained for most of these patients. Occupations and hobbies contributing to lead exposure in 2007 are listed in Table 2. Adult blood lead data for 2008 will be analyzed in spring of 2009.

**Table 2: Minnesota Adults with Elevated Blood Lead Levels in 2007 by Exposure Category**

| Occupation/Exposure | Adults with Levels of 25+ µg/dL | Adults with Levels of 40+ µg/dL |
|---|---|---|
| Painting | 1 | 0 |
| Construction and Demolition | 8 | 1 |
| Fishing Tackle Manufacturing | 16 | 0 |
| Lead Smelting | 90 | 8 |
| Stained Glass | 5 | 0 |
| Stone Product Manufacturing | 2 | 0 |
| Recycling | 7 | 2 |
| Shooting Firearms | 1 | 0 |
| Broke Open Car Batteries | 1 | 1 |
| Casting Fishing Sinkers | 1 | 0 |
| Retained Bullet from Gunshot | 2 | 0 |
| Home remodeling | 1 | 1 |
| Intentional ingestion | 1 | 1 |
| Unknown | 20 | 0 |
| Total | 156 | 14 |

*B. Studies and Projects in At-Risk Populations*

1. Lead in Children Enrolled in Medicaid

National studies (Pirkle et al. 1998, Env. *Health Persp.* 106:745-750) have shown that Medicaid-enrolled children are three times more likely to have EBLLs than non-enrolled children (9% compared to 3%). Medicaid's Early and Periodic Screening Diagnosis and Treatment (EPSDT) program requires that well-child visits include blood lead testing at both 12 and 24 months. In Minnesota, testing of children enrolled in Minnesota Health Care Programs (MHCP), including Medicaid, is under the jurisdiction of the Minnesota Department of Human Services (DHS). Despite the testing requirement, nationally only about 19% of Medicaid-enrolled children ages one to five were tested according to a 2000 report by the Government Accounting Office.

The MDH Lead Program and DHS released a joint study in 2002. It showed that children enrolled in MHCP had higher lead poisoning rates. MHCP children were nearly twice as likely as non-MHCP children to have EBLLs (9.8% compared to 5%). However, despite their high-risk status, only 13.3% of MHCP children were tested for blood lead in 1998.

Analysis of 1999-2003 data for Minnesota children enrolled in Medicaid funded programs provided good news about testing in the Medicaid-enrolled population. The rate of blood lead testing in the total population of 9- to 30-month-old children enrolled in MHCP increased from 17% to 29% between 1999 and 2003. The 9-30 month age group is used in analysis since this captures children tested around their one and two-year well-child visits as recommended in both DHS and MDH guidelines. The rate of EBLLs in tested children declined from 6% in 1999 to 2.7% in 2003. However, there remained a two-fold higher rate of EBLLs in MHCP children in

2003 (3.4% and 1.5% for MHCP and non- MHCP children, respectively). The percentage of MHCP children with EBLLs who were re-tested within three months increased from 39% in 1999 to 50% in 2003. These results were published in *Minnesota Medicine,* available at www.mmaonline.net/publications/MNMed2006/May/clinical-zabel.htm in the May 2006, Volume 86 issue.

When combined with data from the reports described above, the data for 2004 through 2007 also show a continuing trend toward higher rates of testing in MHCP-enrolled children (Figure 3), along with declining rates of EBLLs in both MHCP-enrolled and non-enrolled children (Figure 4). To help sustain these gains, DHS continues to include provisions in their managed care contracts which encourage blood lead testing. A $30 incentive is provided for every child above the previous year's level of testing. DHS also includes blood lead screening among the performance goals that must be met for health plans to receive the 5% of their contract amount that is withheld at the beginning of each contract year.

**Figure 3. Children Enrolled in MHCP Tested for Blood Lead**

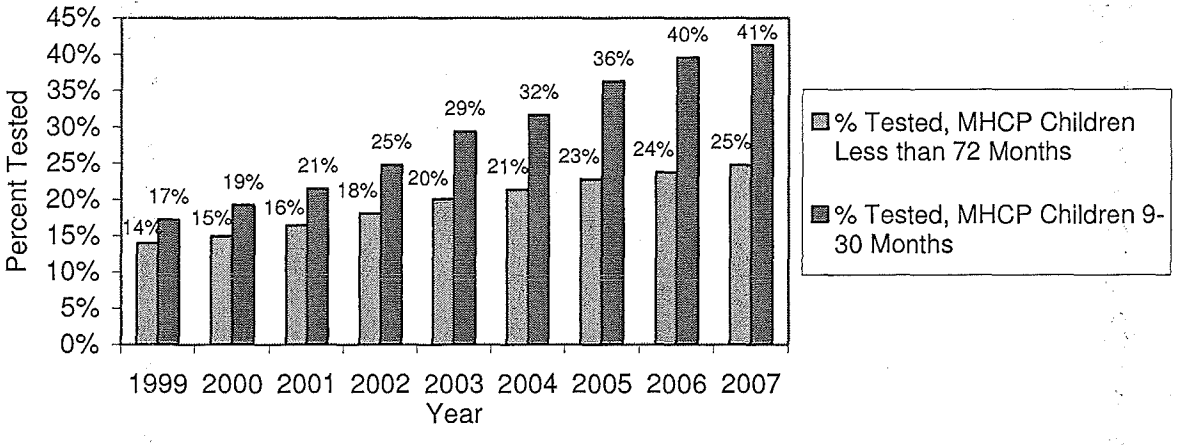
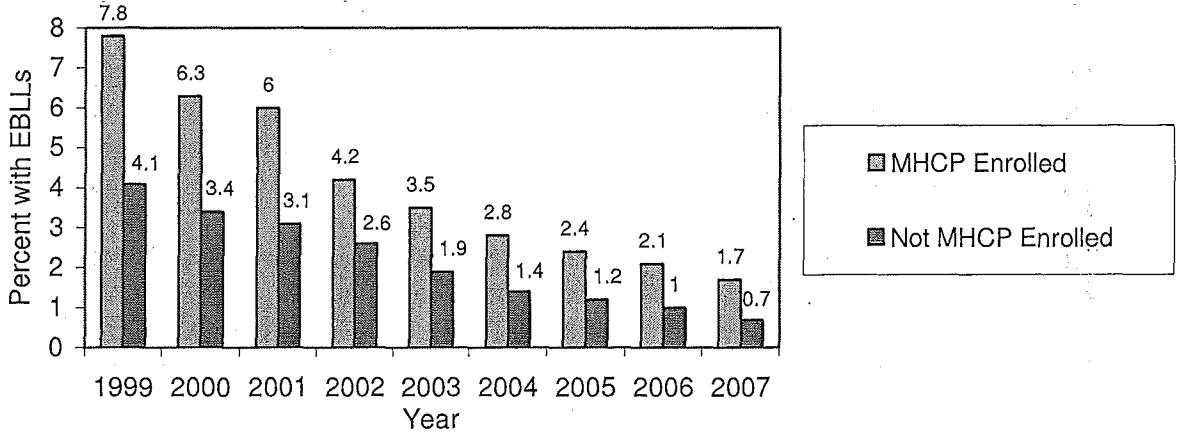



**Figure 4. Percentage of Tested Children Less than 72 Months Old with EBLLs**



2. Lead in Minnesota Venison

Many states have programs in which hunters may donate venison to food shelves or pantries by bringing their field-dressed deer to meat processors, who provide the processed venison to food charities. In March 2008 a physician in North Dakota performed radiographic analysis on venison packages from food shelves in that state. A high percentage of the packages showed visible metal fragments on the X-ray images. Minnesota Department of Agriculture (MDA) staff obtained packages from Minnesota food shelves and performed similar analyses. The results were similar to North Dakota, with approximately 25% of packages showing fragments. Chemical analysis detected the presence of significant quantities of lead in the packages. As a result of this discovery MDA suspended venison distribution from food shelves in Minnesota in the Spring of 2008. MDH, MDA and the Department of Natural Resources (DNR) have worked together to implement changes to the donation program for the Fall 2008 hunting season and have worked to provide guidance for hunters and their families about consumption of venison, whether it is processed at home or by a commercial processor. More information is available on the MDH Lead Program Web site at http://www.health.state.mn.us/divs/eh/lead/leadinvenison.pdf, on the DNR Web site at http://www.dnr.state.mn.us/hunting/lead/index.html, and on the MDA Web site at http://www.mda.state.mn.us/licensing/meategg/processorinfo.htm.

3. Lead in Refugees

Refugees are a population at high risk for lead poisoning. Refugees may have lead exposure risk factors in their countries of origin, such as use of herbal remedies, cosmetics or spices that contain lead, leaded gasoline, cottage industries that use lead in an unsafe manner, and limited regulation of emissions from larger industries. Once they are in the U.S., refugees frequently move into older, inner city housing, with potential for exposure to lead-based paint. The Division of Infectious Disease Epidemiology, Prevention, and Control at MDH collects demographic data on all refugees entering the state who receive an initial health screening. The 2007 refugee data were linked with the blood lead test results from BLIS to describe lead testing and EBLL rates in refugees. Refugee children in Minnesota comprise a wide range of ethnic origins, as shown in Table 3. Of all refugee children entering Minnesota in 2007, 94% received health screening. Of the children seen for an initial health screen in 2007, 97% were tested for blood lead.

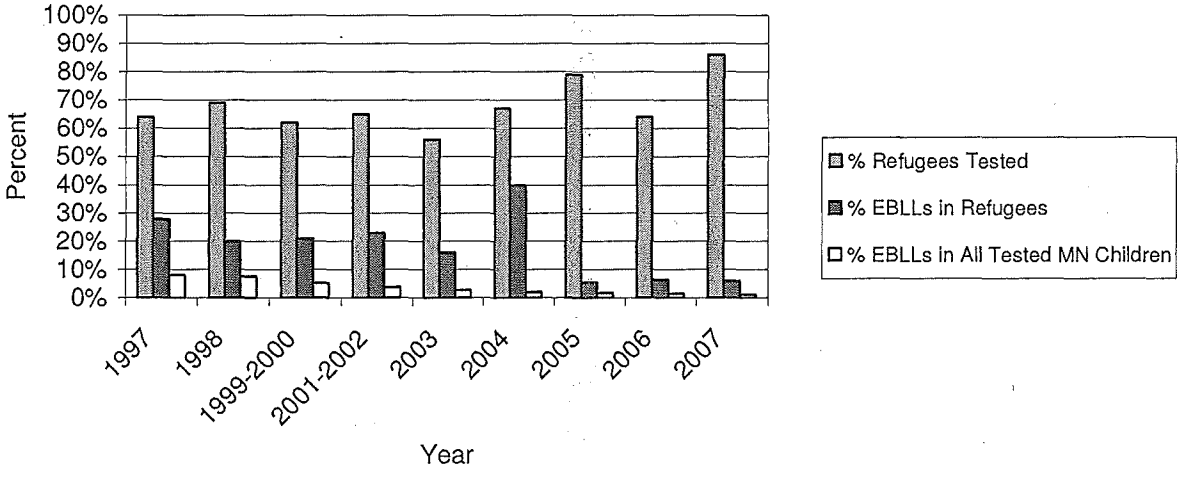
**Table 3. Number and Percent of Refugee Children (0-72 Months) Tested and with Elevated Blood Lead Levels in 2007 by Country of Origin**

| Ethnicity/ Region of Origin | # of Refugee Children* | # of Children Tested for Lead | | Of Children Tested for Lead, # Tested Within Three Months of Arrival | | Children w/Elevated Level (10 µg/dL) | |
|---|---|---|---|---|---|---|---|
| Burma | 93 | 89 | 96% | 87 | 98% | 7 | 8% |
| Ethiopia | 14 | 14 | 100% | 14 | 100% | 2 | 14% |
| Former USSR | 20 | 18 | 90% | 13 | 72% | 0 | 0% |
| Hmong/Laos | 10 | 7 | 70% | 6 | 86% | 0 | 0% |
| Liberia | 30 | 29 | 97% | 27 | 93% | 3 | 10% |
| Rest of Africa | 12 | 9 | 75% | 8 | 89% | 0 | 0% |
| Rest of Asia | 6 | 1 | 17% | 1 | 100% | 0 | 0% |
| Somalia | 53 | 49 | 92% | 47 | 96% | 0 | 0% |
| **Total** | **238** | **216** | **86%** | **203** | **94%** | **12** | **6%** |

*Data obtained from MDH Infectious Disease Epidemiology, Prevention and Control Division

Blood lead tests were also matched to refugee information in past years (Fig. 5). The rate of EBLLs for refugees has dropped in the past several years, but was still approximately five times the rate for blood lead tests statewide in 2007.

**Figure 5. Lead Testing and EBLLs in Refugee Children**




In early 2005, CDC issued new guidelines for blood lead testing in refugee children. These guidelines include lead testing for refugee children up through age 15, a repeat blood lead test after three to six months in the U.S., blood chemistry for iron status, use of pediatric multivitamins, and educational efforts for providers and families. These new guidelines were issued in response to a number of lead poisoning cases, including one death, in refugees in New Hampshire. In many of those cases, the children arrived with low lead levels, but were exposed to lead in the old homes in which they resided. The lead in these old homes was absorbed easily by refugee children due to their poor nutritional status.

In response to the new CDC guidelines, MDH staff (both Refugee Health and CLPPP) collaborated with the refugee health screening clinic at the St. Paul – Ramsey County Department of Public Health to conduct a pilot study to determine the feasibility of the recommendations. Specific activities that occurred through this project were: testing blood lead levels in new refugee children aged 6 months through 15 years, performing complete blood count and blood chemistry for iron status, and obtaining follow-up lead tests on refugee children after three to six months in the U.S., even though their initial test was below the level of concern. Follow-up testing was performed to make sure their lead levels did not increase due to poor nutritional status when entering the country combined with lead exposure in the U.S. St. Paul - Ramsey Department of Public Health nurses followed up with parents and physicians on any test results that were of concern. Of the 150 children seen at the clinic, all received initial blood lead testing and 140 were tested a second time after living in the U.S. Initial EBLLs were observed in five of the children screened (3.3%), and only one child (0.7%) had a low initial test with an elevated second test. A full report was published in the March/April 2008 issue of *Public Health Reports*, and is available at: http://www.publichealthreports.org/userfiles/123_2/111-116.pdf.

The CLPPP has also collaborated with the MDH Refugee Health Program on a national study to assess lead exposure and lead poisoning risk for new refugees in the U.S. The study is directed by Dr. Paul Geltman of the Massachusetts Department of Health and began in Spring 2007. Minnesota is serving as one of the study areas in which families of 30 refugee children will answer a lead risk survey and have a home lead hazard assessment performed. Minnesota data will be combined with data from other states to assess the risk of lead poisoning faced by refugees across the nation.

*C. Screening and Case Management*

1. Blood Lead Guidelines

MDH has developed a set of four guidelines for lead: Blood Lead Screening, Childhood Blood Lead Case Management, Childhood Blood Lead Clinical Treatment, and Blood Lead Screening for Pregnant Women. These guidelines were developed by collaborative workgroups and have been endorsed by a range of professional health organizations. All four guidelines may be found at the MDH Web site at www.health.state.mn.us/divs/eh/lead and the single page versions are included in **Appendix C**. In addition to the guidelines from MDH, local public health agencies may review risk factors for elevated blood lead and the available blood lead screening data to assess concerns about lead poisoning in their areas. This will allow local agencies to develop treatment guidelines tailored to the risks in their areas. Factors to be considered locally are the age and condition of housing stock, the size of the population, screening practices of the area health care providers, occupational and community sources of lead, socio-economic status of the population and other unique risk factors in the community. The assessment should address the amount of screening that takes place relative to the size of the childhood population, the relative number of elevated cases that are found, and the use of other screening tools, such as questionnaires, to identify risk factors.

## Blood Lead Screening Guidelines

The MDH Blood Lead Screening Guidelines recommend that physicians order blood lead tests for 1) children residing in specific geographic areas that have a high rate of cases of elevated blood lead and 2) children matching specific demographic groups that have a high rate of elevated blood lead. Universal screening is recommended for children residing in Minneapolis and St. Paul and those recently arriving from other major metropolitan areas or other countries. Testing is also required for children receiving Medicaid. The test is typically performed when the child is one and two years old, but may be done at any time if the parent is concerned or if a high-risk activity (e.g. remodeling a home built before 1950) has recently occurred.

## Childhood Blood Lead Case Management Guidelines

The MDH Childhood Blood Lead Case Management Guidelines are intended to serve as minimum case management guidelines for providing services to children with EBLLs. They were developed to establish standardized minimum levels of care. However, those counties that have greater resources available may wish to take a more rigorous approach to case management. The guidelines help ensure that a qualified case manager is available to oversee the treatment and recovery of each child, and to ensure that steps are taken to prevent further exposure of the child to potential sources of lead. The case management guidelines work in concert with the MDH Blood Lead Screening Guidelines for Minnesota to identify and manage lead exposure in children. Appropriate steps are presented for both capillary and venous test results.

## Childhood Blood Lead Clinical Treatment Guidelines

The Childhood Blood Lead Clinical Treatment Guidelines were designed for physicians to assist them in treating a patient with an EBLL, thus ensuring that all EBLL cases in Minnesota receive a consistent level of care. Although the current "actionable" level for lead case management and clinical treatment activities in Minnesota is 10 μg/dL, the CLPPP strongly believes that families with documented lead exposures below this threshold should receive guidance from public health and medical professionals. Clinical treatment guidelines for blood lead levels less than 10 μg/dL were reviewed by a group of five physicians during 2005. Their consensus was that education should be provided and encouraged for children with blood lead levels of 5-10 μg/dL, but further clinical treatment is not required. This "anticipatory guidance" has been incorporated into all of the MDH guidelines.

## Blood Lead Screening Guidelines for Pregnant Women in Minnesota

In June 2004, MDH developed Blood Lead Screening Guidelines for Pregnant Women in Minnesota. They are designed for Ob/Gyn physicians, nurse practitioners, and midwives to assist them in screening and treating pregnant women for elevated blood lead levels, thus ensuring that both the women and their children receive appropriate intervention to reduce their lead exposure.

Prenatal lead exposure is of concern because it may have an effect on intellectual development (Schnaas et al. 2006, *Env. Health Persp.* 114:791-797). In addition to fetal risk, lead may be a risk to the mother; it has been shown to be related to cardiovascular disease (Menke et al.,

*Circulation*, Sept. 2006). Lead is transferred from mother to fetus because the placenta is a weak barrier to the passage of lead. Consequently fetal blood may contain the same concentration of lead as maternal blood. The CDC and MDH consider 10 µg/dL and above to be an elevated blood lead level for pregnant women as well as children.

In many cases, high levels of lead in pregnant women arise from maternal occupational exposure. However, other lead exposures may occur, such as: remodeling a home containing lead paint that allows lead dust to become airborne and inhaled; a family member's occupation or hobby resulting in "take-home" lead; using non-commercial home remedies or cosmetics that contain lead; using non-commercial glazed pottery for cooking; and pica behavior of the mother, such as eating soil or pieces of clay pots. There may also be exposure of the fetus to lead coming out of the mother's bones, arising from past exposures of the mother. Lead may come out of maternal bones faster during pregnancy and lactation because of the mother and fetus's need for calcium. A diet rich in iron and calcium may help reduce absorption of lead during pregnancy.

Not every woman is at risk for lead exposure, so a risk screening questionnaire should be used to decide when to test a pregnant, or potentially pregnant, woman for lead.

2. Case Management

The MDH State Case Monitor provides technical assistance to all local public health agencies in the state of Minnesota to ensure case management services for children with elevated blood lead. Specifically, the state case monitor's duties include:

- Assuring case management activities and follow-up testing, for children and pregnant women that have EBLLS above 10 µg/dL, are performed consistent with MDH guidelines;
- Communicating regularly with the Asbestos and Lead Compliance Unit to assess progress on open lead cases and facilitate communication between the Asbestos and Lead Compliance Unit and local lead case managers; and
- Holding educational workshops to educate medical professionals about the Minnesota guidelines for Screening, Treatment, and Case Management. The most recent set of educational workshops was held in Fall 2007.

Case monitor activities have helped clinicians improve their adherence to Minnesota Guideline procedures. A reporting and tracking form and case monitoring database were developed in collaboration with local agencies, including an automated process for sending notice letters to local agencies when an EBLL case occurs in their jurisdiction. This allows for complete records on all medical cases and facilitates communication.

*D. Legislative Activities*

In 2007 there were ongoing questions in the lead community regarding the role of testing in lead poisoning prevention and appropriate testing methods. Therefore, the 2007 Legislature directed MDH to conduct a study to evaluate blood lead testing methods used to confirm elevated blood lead status (Laws of Minnesota 2007, Chapter 147, Article 16, Section 18). The resulting MDH 2008 Blood Lead Testing Methods (BLTM) Report to the Legislature contains a study of three

topic areas: the false positive rate of capillary tests for children less than six years of age, current protocols for conducting capillary testing, and existing guidelines and regulations from other states and federal agencies regarding lead testing. The BLTM report also includes two MDH recommendations regarding the lead program: 1. MDH recommends not using capillary tests to trigger environmental or medical interventions because of their high rate of false positive results. Capillary tests are very useful as screening tests, but we should continue to require confirmatory venous tests for initiating interventions. 2. MDH recommends not lowering the state's mandatory intervention level to 10 micrograms of lead per deciliter (µg/dL) of whole blood. After weighing the benefits and costs involved, MDH contends that a more effective and sustainable positive public health impact could be gained by using resources to work toward a comprehensive statewide healthy housing plan. The full BLTM report is available on the Lead Program Web site: www.health.state.mn.us/divs/eh/lead/reports/legislativerept07.pdf.

In addition to the specific legislative report described above, lead program staff members are regularly called upon to provide data, background, and technical perspective on bills addressing lead poisoning.

## II. Compliance Activities

The 2000 U.S. Census estimates that Minnesota has just over 2 million housing units, with over 560,000 of those units built before 1950. Homes built prior to 1950 are the most likely to contain the highest levels of leaded paint. The MDH Lead Compliance Unit ensures the public receives safe and proper lead hazard reduction, evaluation, and analytical services by requiring those services be conducted according to state regulations, and by trained and licensed personnel, and certified firms. The Lead Compliance Unit was authorized by the U.S. Environmental Protection Agency (EPA) in September 1999 to administer and enforce the lead accreditation and compliance program in Minnesota. The Unit licenses lead risk assessors, lead inspectors, lead workers, lead supervisors, lead project designers, and certifies firms who conduct regulated lead work. In addition, the Lead Compliance Unit approves initial and refresher lead training courses for these disciplines and registers lead sampling technicians.

The goal of regulation and enforcement in the MDH lead program is to limit lead exposure for children with EBLLs and their families, and increase their understanding of lead-related health hazards. This regulatory role contributes to the core public health function of assurance - that is, the process of assuring that populations are having their basic health needs met.

The number of firms certified to perform regulated lead work in Minnesota continues to be stable. The number of residential lead hazard reduction notices submitted to MDH decreased slightly over the past two years.

### *A. Compliance Monitoring*

MDH is the primary agency for lead control and for regulating lead-related activities in Minnesota. MDH provides leadership on lead control program issues and works closely with federal, state, and local agencies, and other interested parties. Compliance monitoring involves efforts by the lead program to monitor and evaluate individuals and companies as they perform

regulated lead work.

A key objective of lead compliance is to make sure that potential environmental sources of lead exposure for persons with lead poisoning are properly addressed. The medical needs of the lead poisoned person are addressed through the collaborative efforts of surveillance staff, health care providers and case managers. Compliance monitoring involves efforts by the lead program to identify actual and potential environmental sources of lead exposure for persons with EBLLs. As described above in the Surveillance section, the 2005 Minnesota legislature lowered the mandatory environmental intervention blood lead level to a single venous result of 15 µg/dL. The MDH Lead Compliance Unit is responsible for performing environmental interventions in areas not covered by another assessing agency.

Currently, Minnesota has 146 certified lead firms. The total number of firms includes 29 firms that conduct lead inspections, risk assessments and project design. The other 110 firms conduct actual lead reduction services. Seven firms are related to in-house activities conducted by housing rehab programs and property management firms. Of the 146 certified lead firms, 54 percent of the certified firms in the state are located in greater Minnesota. The number of certified firms has increased by 12 within the state since 2007. This increase is likely partially due to recent awards of Department of Housing and Urban Development (HUD) funding for lead hazard reduction projects in the Twin Cities and the greater Minnesota area.

Table 4 reflects the current number of lead licensed individuals as of December 2008. The table also includes the number of registered lead sampling technicians. These licenses are renewed annually if the individuals want to continue conducting regulated lead work.

**Table 4: Total Number of Licenses Issued Across Minnesota as of December 2008**

| License issued | Total in MN |
|---|---|
| Inspector | 1 |
| Project Designer | 4 |
| Risk Assessor | 166 |
| Supervisor | 298 |
| Worker | 133 |
| Lead Sampling Technicians | 38 |

The number of lead workers has increased by 14 when compared with the December 2006 data available in the 2007 legislative report. The number of lead risk assessors and supervisors has increased by 13 and 75, respectively, whereas the number of project designers decreased by two. The number of registered lead sampling technicians has increased by six. Most individuals choose to become licensed as risk assessors rather than inspectors because of the limited services the inspector category can provide.

*B. Special Projects*

The EPA regulates lead as part of Section 406(b) under Title IV of the Toxic Substances Control Act (TSCA). Section 406(b) is also known as the Pre-Renovation Lead Information Rule or the PRE. In general, the PRE requires contractors to provide a lead informational pamphlet (notice)

to occupants and property owners in housing built prior to 1978 prior to conducting any renovation activities. The contractors are required to document that the notice was provided. EPA continues to encourage state programs to develop requirements similar to that of the PRE in order to become authorized programs under EPA and administer the requirements at the state level rather than at the federal level. EPA's ability to actively investigate compliance with the PRE is limited by distance and sheer number of affected parties.

MDH mailed out over 15,000 brochures to Minnesota licensed general contractors to educate them on the 406(b) requirements. The effort allowed MDH to distribute over 200 compact discs that contained fact sheets, the Lead-Based Paint Pre-Renovation Education Rule, 406(b) notification and sign-off forms, and many informational materials.

MDH is continuing its efforts in providing lead safe work practices information and brochures to licensed contractors in the state, including information at the department's website (http://www.health.state.mn.us/divs/eh/lead). EPA has modified the brochure (Protect your Family from Lead in the Home) to the Renovate Right brochure. General contractors and other related construction trades are required to provide the new brochure after December 22, 2008. The change in the brochure information is in response to a new EPA regulation (Renovation, Repair, and Painting Rule or RRP) that was implemented on April 22, 2008.

MDH has already begun the process of working with the rehabilitation industry in Minnesota, including the Builders Association of Minnesota (BAM) and its fourteen affiliations located throughout Minnesota. Educational events will be held to inform interested general contractors and the construction trades regarding the EPA renovation regulation. As a result of passage of the RRP, MDH is currently in the process of working towards development of an RRP regulatory program consistent with the federal regulation.

*C. Training Courses*

For an individual to be licensed in Minnesota, they must successfully complete a training course provided by an approved training course provider. Currently five providers offer Lead Hazard Reduction training in Minnesota (www.health.state.mn.us/divs/eh/lead/prof/trainers.htm). Providers must furnish documentation that they employ a training manager and a principal instructor for each of the courses they offer. Both the training manager and principal instructor must meet experience, training and education requirements established in Minnesota Rules (4761.2000-4761.2700). The MDH lead compliance staff regularly review the training course content and ensure that it contains all the required topics.

*D. Legislative Activities*

The MDH Lead Compliance Unit routinely assists in preparing responses to legislative inquiries on lead hazard reduction, intervention levels, and enforcement. This includes preparing fiscal notes, bill summaries, and required reports.

*E. MDH Compliance Inspections*

MDH monitors firms and individuals performing regulated lead work. This is done by verifying that certified firms are employing MDH-licensed individuals to perform regulated lead work in affected property (e.g., single-family residences, multi-family properties, or child-occupied facilities). The monitoring includes both notices and inspections. Non-compliance is managed according to the Health Enforcement Consolidation Act (MS 144.989 to 144.993). MDH also provides technical assistance to the regulated community through information on lead hazard reduction and compliance issues observed during inspections.

Table 5 reflects the number of lead abatement notices submitted to MDH, the number of inspections conducted by MDH and the number of project sites where enforcement actions were taken against certified lead firms and licensed individuals. Lead abatement notices are required when the "intent" of the work is lead abatement. MDH conducts inspections of lead abatement projects based on the notices submitted by certified lead firms. The numbers reflected in this table are based on the EPA's fiscal cycle years 2007 and 2008. A cycle year runs from October to September. Therefore, 2007 cycle year is for October 2006 to September 2007, and 2008 cycle year is for October 2007 to September 2008.

**Table 5: Number of Lead Notices and Compliance Activities for Fiscal Cycle 2007 and 2008**

| Item | 2007 | 2008 |
|---|---|---|
| Number of Lead Notices | 228 | 236 |
| Number of MDH Inspections | 32 | 33 |
| Number of MDH Audits | 68 | 32 |
| Number of Enforcement Cases | 49 | 49 |

The number of lead notices submitted to MDH has been steady over both fiscal cycles. This is due in part to HUD lead hazard reduction grants awarded to the City of Minneapolis, City of St. Paul/Ramsey County, Hennepin County, MDH, and the City of Duluth. The grants require contractors to notify MDH when the primary intent is to perform lead hazard reduction in affected properties.

The number of MDH inspections is based on benchmarks defined in a work plan submitted and approved by EPA on an annual basis. The benchmark for both fiscal cycles was 30 inspections.

MDH also conducts audits of licensed risk assessors' risk assessment reports and licensed supervisors' lead hazard reduction reports. In fiscal years 2007 and 2008, 13 cases had enforcement issued for failing to complete the reports in accordance to the Minnesota rule requirements. The remaining enforcement cases during the same time period were based on lead hazard reduction project site inspections or complaints received by MDH.

## III. Health Education and Outreach

The MDH Lead Program currently performs outreach and education activities for providers and the public through a variety of activities. A strong network has been forged through collaborative approaches to dealing with lead issues. Educational outreach has been conducted for numerous segments of professional and public groups through many types of meetings and presentations. Public awareness of lead issues is further raised through National/Statewide events such as Lead Poisoning Awareness Week and federal requirements for home sellers to disclose information about lead hazards.

### *A. Collaborative Workgroups*

The development and implementation of effective lead poisoning prevention strategies is a collaborative activity. Success requires strong partnerships between public health agencies, health care providers, housing agencies, non-profit organizations, and individual citizens. As part of a general effort to forge those partnerships, all lead program staff at MDH have assumed some degree of responsibility for education and outreach activities as part of their regular job duties.

The Minnesota Collaborative Lead Education and Assessment Network (M-CLEAN) continued to meet two times per year, bringing together statewide lead partners to facilitate information sharing, provide program updates, and promote joint projects. For example, contacts fostered at M-CLEAN meetings led to several federal lead grant applications for lead hazard reduction, lead education, healthy homes, and other issues. The MCLEAN met on April 18, 2007, October 24, 2007, April 14, 2008, and October 29, 2008.

Several staff from MDH assisted the City of Minneapolis and Hennepin County in the creation of their joint Minneapolis – Hennepin County Lead Testing Task Force. Although the task force was started in 1999, work continued in the current period through collaboration and subcommittee meetings. The primary goal of the task force is to have lead-safe children throughout Hennepin County and Minneapolis by increasing the availability of lead-safe housing.

The MDH Lead Unit participated in the September 2007 meeting of the Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) in Minneapolis. The ACCLPP advises and guides the Secretary and Assistant Secretary of Health and Human Services and the Director of the CDC regarding new scientific knowledge and technical developments and their practical implications for childhood lead poisoning prevention efforts.

### *B. Outreach*

MDH conducts outreach to both professional and public organizations. Young medical students and practicing physicians are exposed to lead issues and implications through grand rounds presentations, continuing medical education presentations, scientific conferences, and workshops on lead. The MDH lead program also works in collaboration with other MDH environmental health programs to offer educational programs and exhibits in a variety of venues, including

home and garden shows, home improvement fairs, the Minnesota State Fair, and conferences dealing with children's health and education, housing and redevelopment issues, and other relevant issues and concerns.

MDH was contacted by the press for information on lead hazards from various sources including artificial turf, children's Halloween makeup, children's jewelry, holiday decorations, imported candy, and venison. These requests were handled in addition to many blood lead testing data requests. All information requests were dealt with in a manner consistent with MDH guidelines.

One of the major partners of the MDH Lead Program is the Minneapolis-based Sustainable Resources Center (SRC). SRC is currently contracted to do outreach services to rural areas and the Somali population and to perform targeted home cleaning and education services in coordination with local assessing agencies across the state. SRC provides state-funded swab team services along with family education as a short-term primary prevention step to reduce lead exposure. Swab teams use intensive cleaning methods to temporarily reduce hazards from lead dust, and are normally performed as an interim measure until full lead hazard reduction activities are available. Rural outreach on lead education utilizes SRC relationships with Early Childhood Family Education (ECFE), daycares, and other groups that work with families with young children. Somali outreach includes raising awareness of lead issues and capacity building for lead education and remediation. In order to reach at-risk children who are not seen for routine screening, SRC performs lead testing at neighborhood events using the "Leadie Eddie" van. The MDH Lead Program works closely with SRC by providing educational material in appropriate languages, assisting with referrals of EBLL cases for interim lead control, and providing guidance on special projects.

In September 2004, ECHO (Emergency and Community Health Outreach) launched a first-of-its-kind television series on Twin Cities Public Television (tpt) Channel 17. An estimated 1.2 million households in the Twin Cities Metro area and western Wisconsin are covered by the signal. Every month, tpt broadcasts a 20-minute segment (hosted by members from ethnic communities) in six languages: Hmong, Khmer, Lao, Somali, Spanish and Vietnamese. Since ECHO will broadcast live if a statewide crisis or emergency is underway, immigrant/refugee communities are familiar with the program and recognize its broadcasts as important to the health and safety of their families. ECHO is supported by St. Paul-Ramsey County Public Health, Hennepin County Public Health, the Minnesota Department of Health, and other emergency preparedness agencies. In late 2005, the CLPPP contracted with ECHO to get lead poisoning prevention messages out to non-English speaking populations. The shows about lead were taped in July 2006 and were broadcast in October 2006. DVDs of the production are available for future use in education of non-English speaking populations. These productions are also available for viewing on ECHO's website at www.echominnesota.org. To date, 2,330 copies of the ECHO DVD have been distributed.

*C. Internet Resources*

The Lead Program maintains a web page through the MDH Internet site that provides a number of lead education materials for providers, regulated parties, and the general public (www.health.state.mn.us/divs/eh/lead). The site contains information on hot topics (including

current data, projects and requirements), numerous fact sheets, a list of "frequently asked questions" and responses, all publications and reports (including guidelines for screening, case management, and clinical treatment in children, and screening of pregnant women), a downloadable version of a lead education workshop, and links to many external lead resources. The Lead Program web site offers several lead fact sheets and pamphlets in Spanish, Somali, and Hmong.

*D. Promoting Lead Awareness*

Efforts to raise awareness of lead poisoning have included national "Lead Poisoning Prevention Week," which was held October 21–27, 2007 and October 19-25, 2008. These time periods were designated by key federal agencies that work most directly to prevent lead poisoning: CDC, EPA, and HUD. To support national lead week, the MDH lead program prepared press releases describing lead poisoning prevention activities occurring in Minnesota.

Federal requirements promote awareness among homeowners and renters before they move into a new home. EPA and HUD both require sellers and leasers of pre-1978 housing to disclose the presence of known lead hazards, including lead-based paint. Sellers and leasers must also provide purchasers and lessees with any available records or reports with relevant information about such hazards and must provide purchasers and lessees with the federally developed pamphlet "Protect Your Family From Lead In Your Home." Sales and leasing contracts must include a Disclosure of Information on Lead-Based Paint and/or Lead-Based Paint Hazards form. These requirements help ensure that families receive the necessary information to make informed decisions and protect their families from lead hazards when purchasing or leasing property. These forms and pamphlets are readily available from MDH at the Lead Program Web site.

The annual surveillance report for 2007 for all local public health agencies was released on June 30, 2008 (**Appendix B**). The annual report is purposely prepared at the end of the fiscal year to include the most current data in the year-end analyses. The report included county-specific analyses of rates of screening and EBLLs, along with testing rates and rates of EBLLs in Minnesota's high-risk populations, including refugee children, children enrolled in Minnesota Health Care Programs, and occupationally exposed adults. The Web site link to the full report is emailed to all local public health agencies and other lead stakeholders in Minnesota each year.

## Policy Planning and Program Evaluation

The MDH Lead Program currently addresses all elements of a comprehensive state lead program. In addition to having sufficient legislative authority and staffing capacity to undertake current program activities, staff meet at regular intervals to assess service gaps and plan for ongoing activities. The capacity to address multiple aspects of lead poisoning prevention in Minnesota will contribute to the overall federal effort to eliminate childhood lead poisoning by 2010 and statewide efforts at providing healthy homes.

*A. Data Quality Evaluation*

Quality control procedures have reduced errors and increased completeness in the reporting of

testing data. Missing information such as the patient's date of birth, address, and the type of test used are obtained for all reported tests when available from testing clinics and providers. After initial entry into BLIS, each record is reviewed for accuracy by a different member of the program staff. The completeness of the reporting data and the timeliness with which it is entered in the database are reviewed annually. Results of this review process are shared with the reporting laboratories, and have contributed significantly to improvements in the quality of data submitted by the laboratories. The BLIS database was evaluated and refined periodically throughout 2007 and 2008. Several manual quality control procedures were incorporated into the BLIS database when it was migrated into a new Oracle software platform in 2006. Quality control improvements included verification of key data fields (e.g. patient address, physician and clinic information), auto-fill of city and county based on zip code, and boundary warnings on test results. Analyzing laboratories are encouraged to send their information electronically, which reduces data entry errors and the time required for the data entry process.

*B. Childhood Lead Poisoning Elimination Plan*

In 2004 MDH collaborated with a planning advisory work group to develop a strategic plan to end childhood lead poisoning in Minnesota by 2010. This plan, which was endorsed by the Governor, has been known as the Minnesota 2010 Childhood Lead Poisoning Elimination Plan (Elimination Plan). To better reflect a long-term commitment to addressing childhood lead poisoning, the date "2010" was recently removed from the title of the Elimination Plan.

The Elimination Plan is evaluated every year and re-issued in even-numbered years. The most recent evaluation and assessment of progress on individual tasks in the 2006 version of the Elimination Plan was conducted in 2007. A report summarizing the results of the 2007 evaluation is posted at: http://www.health.state.mn.us/divs/eh/lead/reports/2010update2007.pdf . The most recent version of the Elimination Plan was released in 2008. The Elimination Plan was reviewed and discussed at every meeting of the MDH-sponsored MCLEAN.

The Elimination Plan released in 2008 contained amendments based on the 2007 evaluation, recommendations presented at MCLEAN meetings, and additional feedback from partners outside of MDH. While individual tasks in the Elimination Plan were changed to meet evolving conditions in lead poisoning prevention, the same fundamental five goals that were found in previous versions remained valid and unchanged. The fundamental goals are:

I. Developing strategies for lead education and training.
II. Developing strategies for identifying at-risk properties and children.
III. Developing strategies to better incorporate lead paint assessment and control into housing activities and infrastructure.
IV. Developing strategies to identify resources to increase the supply of lead-safe housing.
V. Emerging strategies based upon new research, legislation, trends, population conditions and other developments.

Over the past two years there has been substantial progress in achieving the tasks laid out in the original Elimination Plan and in incorporating new ideas into the current Elimination Plan. The 2008 version of the Elimination Plan differed from the 2006 version of the Elimination Plan in

several respects:

- Recommendations for increasing the supply of lead-safe housing and improving communication between public health and housing agencies were incorporated into the Elimination Plan. The recommendations were produced as part of an evaluation conducted by two Harvard University MPH students in collaboration with CDC.
- Task status was simplified to only three colors: red (scheduled for later fiscal years), yellow (in planning or implementation), or green (completed or ongoing).
- Tasks were added or amended to help address possible sustainable sources of funding for lead poisoning prevention and lead hazard control.
- Tasks which were redundant were consolidated and tasks that were completed were removed. The number of individual tasks was reduced from 120 to 106.
- Tasks were added to address the growing number of non-paint sources, including lead in children's jewelry, packaging, wheel weights, hunter-donated venison, and imported products.

The 2008 version of the Elimination Plan was placed on the MDH Web site (see: http://www.health.state.mn.us/divs/eh/lead/reports/2010planfinal2008.pdf ) and was distributed electronically to participants in MCLEAN.

*C. Healthy Homes*

Low-income and minority individuals and families are disproportionately affected by a number of housing-related health hazards in addition to lead. Occupants of substandard housing units are at increased risk for fire, electrical injuries, falls, rodent bites, and other illnesses and injuries. Indoor environmental quality issues of concern include exposure to pesticide residues, indoor toxicants (asbestos, radon, VOCs), tobacco smoke, and combustion gases. According to research at the Mount Sinai Children's Environmental Health Center, annual costs for environmentally attributable childhood diseases in the US total an estimated $54.9 billion (approximately 3% of total health care costs nationally).

The CDC estimates that providing healthy housing to American families will help prevent 20 million asthma cases, 240,000 incidents of elevated blood-lead levels in young children, 14,000 burn injuries, and 21,000 radon-associated lung cancer deaths nationally. Work done by the HUD over the past 10 years (as presented in the 2008 HUD Healthy Homes Strategic Plan) shows that:

- Unintentional injuries can be prevented by modifying the home environment and educating residents about risks. Some structural adjustments to the home, such as installing railings and hand-holds, smoke alarms, fencing around pools, and water heaters with pre-set safe temperatures are effective injury prevention interventions.
- Corrective measures including paint stabilization, moisture control, treatment of friction surfaces, and enclosure and removal of certain building components coated with lead paint, cleanup, and "clearance testing," have been shown to be effective in reducing dust-lead levels over an extended period.

- Interventions to reduce allergens (and therefore asthma) in the home have proven to be effective and are ready for implementation. These include the installation of impervious pillow and mattress covers, use of HEPA vacuums and air filters, specialized cleaning, and Integrated Pest Management (IPM).
- For radon gas, research indicates that active systems placed in homes in high-risk areas post-construction have effectively lowered radon levels.

The MDH lead program is currently collaborating with other areas in the Environmental Health Division and across MDH to implement a "Healthy Homes, Healthy Places" planning effort. The goal of the effort is to examine methods to address multiple housing-based environmental health risks using "healthy homes" concepts. Ensuring that homes are dry, clean, well ventilated, pest-free, contaminant-free, safe, and maintained will help make indoor environments healthier. Efforts to make indoor environments healthier are expected to:

- improve health, productivity, and quality of life of residents,
- reduce health care costs from common housing-related illnesses and injuries, and
- help diminish health disparities for at-risk populations

Addressing the broad range of housing deficiencies and hazards associated with unhealthy and unsafe homes will require a comprehensive coalition of public health professionals and targeted training. Successful methods and policies for Healthy Homes, Healthy Places may be more easily established using expertise gained from ongoing lead poisoning prevention efforts.

MDH has a potential role of training, educating and providing scientifically based primary preventive practices and procedures that can make homes and other indoor places safer healthier environments. The Healthy Homes, Healthy Places planning effort will complement the Statewide Health Improvement Plan by focusing on the environmental risk factors for both chronic and acute illnesses, helping to reduce health disparities, and implementing primary prevention strategies for homes, schools and work places.

## Funding Status

State general funds are an important part of a larger public health effort to address lead poisoning in Minnesota. Overall program support sources are diverse but rely heavily on base state funding to help maintain capacity, both within MDH and with other partners in lead. The state's general fund allocates about $300,000 annually to the MDH program. These funds are used to help meet MDH statutory obligations and are a critical source of matching funds for federal grant applications. Assessment, assurance, and policy/planning are the three core functions of public health authorities. The environmental health trends identified by assessment (e.g. lead surveillance and compliance activities) will require a strong response with respect to assurance (e.g. compliance monitoring, case management) and policy/planning (e.g. primary prevention, provider/physician education). This will, in turn, require ongoing commitment from state general funds for these activities.

The bulk of funding for the MDH lead program comes from federal sources via grants and cooperative agreements. The lead program has received funds for the last thirteen years from

CDC to maintain a CLPPP program, including blood lead surveillance activities. MDH received $588,754 in Federal FY07 and $588,479 in Federal FY08. The fourteenth application will be submitted in March 2009. Although Minnesota has a very good reputation with federal funding agencies, this revenue stream must be revised annually to ensure alignment with federal priorities and must be regained every five years via a competitive grant application. The CLPPP award is anticipated to continue a gradual decline in funding, with a significant cut likely to come after 2010.

MDH has received Lead Cooperative Agreement and Enforcement grants from EPA since 1994. The funding amount has averaged about $270,000 for each of the past two years. This funding has provided ongoing development and support for the infrastructure of the lead compliance program. As the program has developed, the requirements of the grant have shifted from program development to compliance assistance, compliance monitoring and enforcement. EPA cannot guarantee that future funding will remain at current level but continues to work with all the Region V state lead programs to ensure that they are informed of funding changes.

The State Government Special Revenue Fund fee account has a flat revenue stream of about $55,000 per year generated from accreditation and training permit fees. Currently MDH regulates 146 certified firms and 601 licensed individuals. A small number of lead professionals are employed by local government (e.g. assessing agencies) and are exempt from credentialing fees.

Every two years, MDH awards a one-year Lead Safe Housing Grant totaling up to $25,000 with an option to continue the grant for an additional $25,000 for a second year. The grant is authorized under Minnesota Statutes, section 144.9507, subdivision 3, to provide temporary lead-safe housing and relocation costs for families displaced by lead hazard reduction activities in their primary residence. This grant is competitive and applicants must be boards of health with responsibility under Minnesota Statutes, section 144.9504, for responding to reports of elevated blood lead levels. Hennepin County, City of Minneapolis and St. Paul-Ramsey County are the three local boards of health awarded funds from this grant. During 2007 and 2008, 171 families were relocated to safe-housing units while lead hazard reduction work was completed in the families' primary residence.

During the 2007 legislative session, the Sustainable Resource Center was authorized to receive a one-year Swab Team Services Grant totaling $488,000 with an option to continue the grant for an additional $488,000 for a second year if funds were still available. The grant provides swab team services training to workers and property owners, and provides swab team services on residential properties. Grant funds are also used to remove and replace building components that are identified by a licensed lead risk assessor as being a deteriorated component that also has deteriorated lead-based paint on it.

The initial grant period started on August 1, 2007 and ended on June 30, 2008. The optional second year was granted and will end on June 30, 2009. The 2008 legislative session decreased the grant for the second year by $9,000 due to state funding issues. From August 1, 2007 to June 30, 2008, SRC completed the following services in individual housing units:

- 90 inspections/risk assessments
- 23 residences had swab team services conducted
- 766 windows installed with jambliners or window components were scraped and painted
- 766 windows were replaced

The U.S. National Institutes of Safety and Health (NIOSH) has a purchase order agreement with MDH for approximately $20,486 per year for semi-annual data related to the Adult Blood Lead Epidemiology Surveillance Program. These funds allow MDH to: (1) put emphasis on collaboration and cooperation on lead surveillance issues, (2) maintain primary prevention activities for adults with EBLLs, and (3) prevent "take-home lead" in children.

In 2003, MN Department of Employment and Economic Development (DEED) and MDH partnered to implement a Lead Hazard Control grant in the amount of $2.43 million and remediated lead in over 300 properties. In 2007 MDH was awarded $1.4 million in Lead Hazard Control Grant (LHCG) funds. This second round of funding will help remediate lead in 138 properties. The purpose of the Program is to identify and correct lead based paint hazards in homes occupied by low and moderate income families with children less than six years of age. The primary responsibility for managing the grant program is with the MDH Lead Compliance Unit in partnership with DEED's Small Cities Development Program (SCDP). Agencies administering SCDP rental or owner occupied housing grants will be eligible for funding and will carry out the implementation and administration of the Lead Hazard Control Program on the basis of executed grant agreements with MDH.

Agencies currently administering the LHCG funds are Bi-County Community Action Program of Bemidji, Central Minnesota Housing Partnership of Saint Cloud, Development Services Inc. of Ivanhoe, City of Fairmont, Kootasca Community Action of Grand Rapids, Lakes and Pines Community Action Council (CAC) of Mora, NW Multi-County Housing Redevelopment Authority (HRA) of Mentor, Southeastern Minnesota Multi-County HRA of Wabasha, Stearns County HRA of Cold springs, South West Minnesota Housing Partnership of Slayton, Western Community Action of Marshall, and City of Winona. MDH will also be managing a few independent projects when SCDP funds are not available. The program currently has one project of this type in Lowry, MN. The accomplishments of the LHCG program to date are described in Table 6. For more information see:
http://www.health.state.mn.us/divs/eh/lead/leadgrants/index.html.

**Table 6: LHCG Program Accomplishments**

| | SFY 2007 | SFY 2008 | SFY 2009 | Total |
|---|---|---|---|---|
| Projects Initiated | 0 | 62 | 28 | 90 |
| Total Project Amounts | 0 | $394,868 | $174,071 | $568,939 |
| Projects Completed | 0 | 2 | 7 | 9 |

Reporting period is state fiscal year (SFY), July 1 - June 30

## Future Directions

Future directions for the Minnesota Department of Health are largely determined by the requirements set by funding providers and the state legislature. CDC, which funds the Minnesota Childhood Lead Poisoning Prevention Program, has a federal plan to eliminate childhood lead poisoning by 2010. This will require outreach, surveillance, and follow-up activities in areas that have large numbers of children under six years old and have multiple risk factors for childhood lead poisoning. Primary prevention will be a key aspect of the ongoing federal strategies for lead and will need to be emphasized in future Minnesota efforts. The MDH Lead Program will also work cooperatively with the developing MDH Healthy Homes program, as described above. Lead poisoning prevention activities at MDH will be incorporated into the overall statewide strategy for making homes in Minnesota healthier.

Another goal of CDC is to improve screening rates, information about screening rates, and follow-up services for children with Medicaid status. Screening rates for children with Medicaid status are lower than those for children without Medicaid status, even though federal law states that 1- and 2-year-olds should be screened for lead poisoning. CDC is encouraging states to link their state's Medicaid data with their statewide surveillance databases in order to determine testing rates for children with Medicaid status. MDH will continue to work with DHS, as funding allows, to measure testing rates for the young Medicaid population in Minnesota.

Lead program staff members actively participate in activities to improve the recording and transfer of lead test data. Most large laboratories and clinics currently use some form of electronic data management. It is crucial that MDH continue to develop the capacity to interact with these data streams effectively so that transcription errors are minimized, and time saved.

The EPA participates in the federal plan to eliminate childhood lead poisoning by 2010. Increasing education, compliance monitoring and enforcement of lead paint regulations continues to be a priority for the state as part of federal grant funding provided by EPA. Because the asbestos and lead compliance programs operate as a combined regulatory program within MDH, education, compliance monitoring and enforcement are done routinely. This is unique in comparison to other state programs within Region V. MDH's staff is actively involved in public education, outreach, compliance assistance and monitoring, and responding to public inquiry regarding general indoor air, lead and asbestos issues. Compliance and administrative staff have the necessary training and skills to fully implement compliance and enforcement activities.

Health education is performed by all staff within the lead program using well established information sources and targeted outreach opportunities. As an interdisciplinary program, MDH lead staff will continue to generate unique and innovative approaches to institutional and scientific problems. Approaches will include forming cooperative workgroups to solicit input prior to generating guidelines, cooperating with other agencies to meet common goals, conducting research to address basic problems, and overseeing lead hazard reduction efforts to ensure complete and timely resolution of lead orders. This spirit of creativity will continue to be fostered, resulting in a program that is flexible, responsive, and well grounded in the core public health functions of assessment, assurance, and policy/planning.

## Conclusions

Lead is a major, preventable, pediatric environmental health risk. Although lead is found throughout the environment, the major exposure pathway of public health concern for children is through deteriorated lead-based paint.

The MDH blood lead surveillance database collects blood lead reports on all Minnesota residents. State guidelines help standardize screening practices and raise awareness of high-risk populations. The average blood lead level reported to MDH has been gradually declining, consistent with national trends. Diverse populations are targeted to help address public health disparities.

Compliance monitoring ensures that lead hazard reduction is completed consistent with state statutes and best public health practices. This involves working with assessing agencies and licensed lead workers to address exposure issues (e.g. lead paint removal). Training is provided, inspections performed, and assessments audited as needed to ensure that public health concerns are addressed. Health education is performed by all staff within the lead program using well-established information sources and targeted outreach opportunities.

## Appendices

Appendix A: Minnesota Childhood Lead Poisoning Elimination Plan

Appendix B: 2007 Blood Lead Surveillance Report

Appendix C: Single-Page Summaries of Blood Lead Guidelines

# Appendix A

## 2010 Lead Poisoning Elimination Plan for Minnesota


# *State of Minnesota Childhood Lead Poisoning Elimination Plan*

**September 2008**

# State of Minnesota
# Childhood Lead Poisoning
# Elimination Plan

---

September 2008

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# Table of Contents

## List of Acronyms

ACOG – American College of Obstetricians and Gynecologists
ALC Unit – Asbestos/Lead Compliance Unit (MDH)
CAP – Community Action Program (locally based organizations)
CDBG – Community Development Block Grant
CDC – U.S. Centers for Disease Control and Prevention
CLEARCorps –Community Lead Education and Reduction Corps (AmeriCorps program)
CLPPP – Childhood Lead Poisoning Prevention Program (CDC grant to MDH)
CPSC – Consumer Products Safety Commission
C&TC – Child and Teen Check-up
CUHCC - Community-University Health Care Center
DEED – Minnesota Department of Employment and Economic Development
DHS – Minnesota Department of Human Services (Medicaid agency)
DOLI – Minnesota Department of Labor and Industry
EBLL – Elevated Blood Lead Level
EIA Unit – Environmental Impacts Analysis Unit (MDH)
EPA – U.S. Environmental Protection Agency
GIS – Geographic Information System
HRA – Housing and Rehabilitation Authority (local housing jurisdictions)
HUD – U.S. Department of Housing and Urban Development
LHR – Lead hazard reduction
LSWP – Lead-safe work practices
LUG – Local Units of Government
MA – Medical Assistance (Minnesota equivalent of Medicaid)
MCLEAN – Minnesota Collaborative Lead Education and Assessment Network
MDH – Minnesota Department of Health
MDNR – Minnesota Department of Natural Resources
MEDSS – Minnesota Electronic Disease Surveillance System
MHFA – Minnesota Housing Finance Agency
MMHA - Minnesota Multi-Housing Association
MPCA – Minnesota Pollution Control Agency
MVNA – Minnesota Visiting Nurse Association
NAHRO – National Association of Housing and Redevelopment Officials
NPCA – National Paint and Coatings Association
NRP – Neighborhood Revitalization Program
PHA – Public Housing Authority
PHN – Public health nurse
RPO – Rental property owner
RRP – EPA Renovation, Repair, and Painting rule (issued 2008)
SRC - Sustainable Resources Center
WIC – Women, Infants and Children (Supplemental Nutrition Programs)

Additional definitions for lead in Minnesota can be found in statute (Minn. Stat. 144.9501) and in the MDH Childhood Blood Lead Case Management Guidelines for Minnesota at www.health.state.mn.us/divs/eh/lead.

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## Introduction

Although lead poisoning is preventable and rates are declining in Minnesota, children living in substandard (as defined by building codes), pre-1950 housing continue to be disproportionately affected by lead. In response, the Minnesota Department of Health (MDH) Childhood Lead Poisoning Prevention Program (CLPPP), in collaboration with a wide range of partners, has coordinated the development of a plan to eliminate statewide childhood lead poisoning by 2010. The "State of Minnesota Childhood Lead Poisoning Elimination Plan" (Plan) contributes to meeting the national goal established by the U.S. Centers of Disease Control and Prevention (CDC) of eliminating childhood lead poisoning as a public health problem by 2010.

The original Plan was released in 2004. Members of the Minnesota Collaborative Lead Education and Assessment Network (MCLEAN) meet routinely to evaluate ongoing efforts in the Plan. The MCLEAN meetings also provide an opportunity for sharing information, form collaborations, and learn about current lead issues. Attendees at MCLEAN meetings include federal, state, and local government; community based organizations; health care providers; housing, real estate, landlord, and tenant organizations; and other disciplines. All members listed on p. iii as "Childhood Lead Poisoning Elimination Plan Advisory Members" (Advisory Members) participate in MCLEAN meetings. In addition, key staff from the MDH Lead Program, which includes the Environmental Impact Analysis Unit (EIA) and the Asbestos/Lead Compliance Unit (ALCU), provided feedback on the Plan. Particular attention has been paid to developing and implementing housing-based primary prevention activities.

In 2004 a vision statement for the Plan was prepared along with a Minnesota definition of childhood lead poisoning "elimination." The vision statement and elimination definition remain valid in 2008. The vision statement is:

*"To create a lead-safe Minnesota where all children have blood lead levels below 10 micrograms lead per deciliter whole blood (µg/dL) by the year 2010."*

The elimination definition is:

*"Lead poisoning will be considered eliminated when zero percent of at-risk children who are less than 72 months of age have blood lead levels ≥ 10 µg/dL."***

** The definition of elimination is subject to change due to at least three variables: 1) changes in trends in elevated blood lead levels determined by ongoing analyses of blood lead surveillance and related data; 2) ongoing childhood lead poisoning prevention activities by governmental and nongovernmental agencies; and 3) changes to federal or state guidelines regarding acceptable levels of childhood blood lead.

This 2008 Plan contains background on lead exposure in Minnesota, an assessment of risk factors for lead, and an overview of modifications to the Plan proposed by Advisory Members. The 2008 Plan updates the most recent version of the Plan, which was released in July 2006. An evaluation of the 2008 Plan will be prepared and distributed in 2009, and another comprehensive version of the Plan will be issued in 2010.

## Background on Minnesota's Lead Poisoning Problem

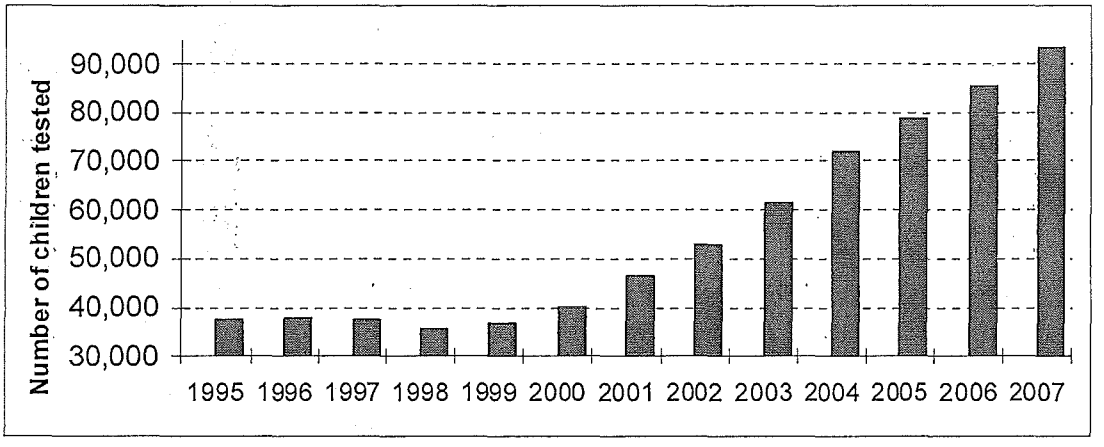
The State of Minnesota has consistently played a leading role in identifying and addressing public health issues related to lead exposure. Partners in lead poisoning prevention across Minnesota are committed to maintaining that leadership role and protecting the citizens of Minnesota from the potentially devastating effects of exposure to high levels of lead.

The MDH is the lead state agency for childhood lead poisoning prevention efforts statewide. Lead poisoning prevention activities at MDH are housed within the Division of Environmental Health. The EIA Unit is responsible for lead-related surveillance activities and implements the CLPPP. The ALC Unit is responsible for assuring compliance with state rules and statutes dealing with lead hazards. Other state agencies dealing with lead include the Pollution Control Agency, Agriculture, Labor and Industry, Natural Resources, Housing Finance Agency (MHFA), Commerce, and Employment and Economic Development (DEED). At the local level, cities of the first class and counties/local public health agencies have a wide variety of duties with respect to lead risk assessment and case management. Nongovernmental advocacy organizations, such as the Sustainable Resources Center (which houses CLEARCorps for Minnesota) and Save All Our Children, also perform essential tasks regarding education, training, and primary prevention pilot projects and assessments.

The MDH collects blood lead reports on all tested Minnesota residents, both children and adults. State guidelines on screening of children and pregnant women, case management, and clinical treatment help standardize practices and raise awareness of high-risk populations. These guidelines are regularly reviewed and updated based on new data and published literature.

Figure 1 illustrates the trend in the number of children tested in past years and gives some indication of how screening practices have improved significantly in Minnesota. Only data for children less than six years old are presented.

**Figure 1: Number of children with blood lead tests reported to MDH from 1995 – 2007. Results include all test types (venous, capillary, and unknown).**



The dramatic increase in blood lead screening in Minnesota is the result of the combined efforts of local, state and federal government and private organizations recognizing the importance of testing children at high risk for lead poisoning and implementing innovative strategies to provide those services to an increasingly diverse and mobile population.

At the state level, the MDH Blood Lead Screening Guidelines for Minnesota were issued in 2000 and have been updated, distributed and promoted among health care providers statewide. In addition, the MDH produces annual reports on blood lead testing, presenting information by county to provide local partners with data about their jurisdictions. The MDH also enforces lead regulations, trains and certifies lead professionals, and collaborates with DEED on U.S. Department of Housing and Urban Development (HUD) lead hazard control grants. The Minnesota Department of Human Services (DHS) established targets and financial incentives for health plans to perform complete Child and Teen Checkups (C&TC), of which blood lead testing is a vital component, on children enrolled in Minnesota Health Care Plans, including Medical Assistance (MA).

Other screening efforts have included targeted projects in Minneapolis, St. Paul-Ramsey County, Hennepin County, rural counties in west-central Minnesota, WIC clinics in high-risk counties, and specific screening projects for refugees and immigrants. As shown in Figure 2, the number of confirmed elevated blood lead levels reported to MDH has been gradually declining over time, consistent with national trends.

**Figure 2: Number of children with elevated blood lead tests reported to MDH from 1995 – 2007.**

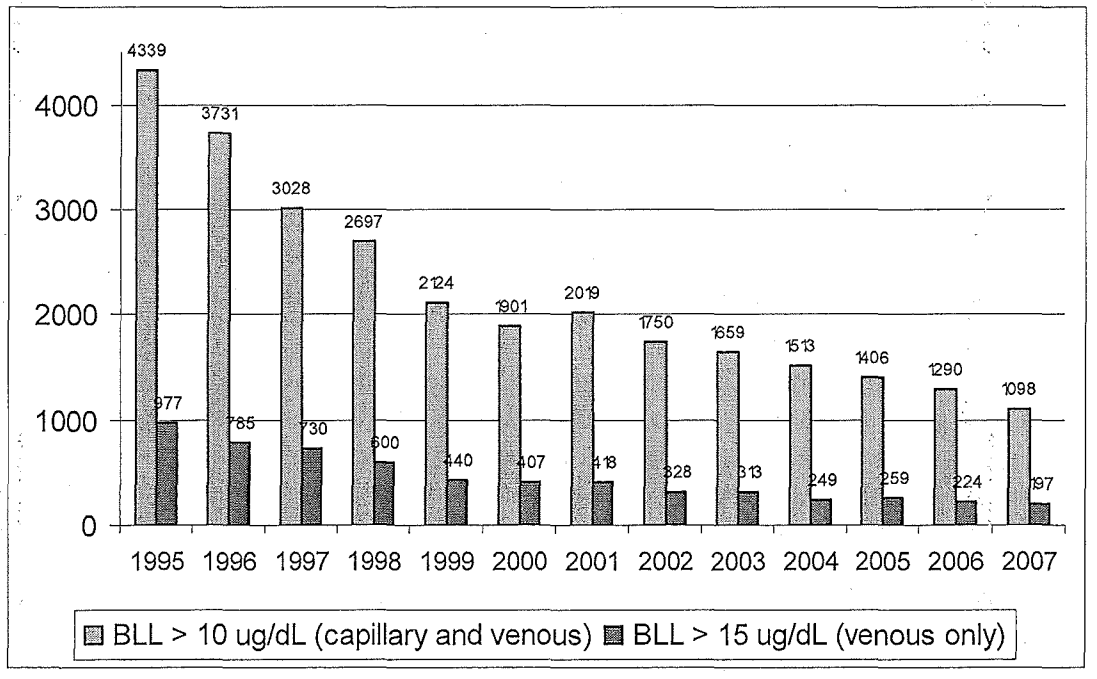


Table 1 presents the distribution of blood lead tests reported to MDH in 2007 based on concentration. The data show that 1,098 of the 93,466 children with reported tests (1.2 percent) were considered to be elevated, which is defined by Minnesota statute as greater than or equal to 10 µg/dL. The confirmed venous elevated blood lead test rate (15 µg/dL or greater) for Minnesota for 2007 was 0.5 percent.

**Table 1: Distribution of Blood Lead Levels in Minnesota Children in 2007. Data are number of children in a given range. If a child had multiple tests, the highest venous level was chosen, followed by the highest capillary level if no venous test was performed.**

| Blood Lead Level (µg/dL) | < 5 | 5-9 | 10-14 | 15+ | Total |
|---|---|---|---|---|---|
| Venous | 13,433 | 1,126 | 295 | 197 | 15,051 |
| Capillary/Unknown | 72,358 | 5,451 | 424 | 179 | 78,415 |
| Total | 85,791 | 6,577 | 722 | 376 | 93,466 |

Compliance monitoring ensures that lead hazard reduction is completed consistent with state statutes and best public health practices. This involves working with assessing agencies and licensed lead workers to address exposure issues (e.g. lead paint removal, window replacement). Training is provided, inspections performed, and assessments audited as needed to ensure that public health concerns are addressed. Health education is performed within the lead programs using well-established information sources (such as a routinely updated Web site) and targeted outreach opportunities. Specific methods for implementing the recently passed "Renovation, Repair, and Painting" rule from EPA are currently being developed.

The complete list of assessing agencies in Minnesota is presented in Table 2 below. These are the governmental agencies with authority to conduct enforceable lead risk assessments on elevated blood lead cases. Many of these groups, along with nonprofit, private, and other organizations, also conduct advisory risk assessments across the state for concerned households on a voluntary basis, regardless of blood lead level.

**Table 2: Assessing Agencies in Minnesota.**

| | | |
|---|---|---|
| City of Bloomington | MDH (82 Counties) | Dakota County |
| City of Minneapolis | St. Paul-Ramsey County | St. Louis County |
| City of Richfield | Hennepin County | Stearns County |

Lead programs across Minnesota strive to devise unique and innovative approaches to institutional and scientific problems. These include forming cooperative workgroups to solicit input prior to generating guidelines, cooperating with other agencies to meet common goals, conducting research to address information gaps, and overseeing lead hazard reduction efforts to ensure complete and timely resolution of lead orders. Diverse populations are targeted to help address public health disparities. Programs across the State are flexible, responsive, and well grounded in the core public health functions of assessment, assurance, and policy/planning.

## Assessment of Minnesota Lead Risks

The MDH maintains an extensive blood lead surveillance system for the purpose of monitoring trends in blood lead levels in adults and children in Minnesota. There are 1,000,000 tests in the system as of April 11, 2008. Of these tests, 864,313 were for kids under the age of six, and they were from 583,591 individual children. Data collection goes back to 1995 and is used to help identify populations at risk for elevated blood lead levels, ensure that screening services are provided to groups with the highest risk of lead poisoning, and provide environmental and medical follow-up to children with elevated blood lead levels.

Work in Minnesota (e.g. Countryside Lead Prevalence Study) and nationally has shown that an estimate of lead risk may be predicted based on two factors: living in a pre-1950 home and being enrolled in Medicaid. The data shown in Table 3 below are taken from the 2000 Census and DHS Medicaid enrollment figures for 2001. These figures do not take into account homes that have already been made lead-safe and assume that the proportion of children is constant across different ages of homes. Children were defined as individuals less than 72 months of age. The number of children is based on a five-year period, assuming approximately 67,000 children per year group.

**Table 3: Housing and population characteristics for Minnesota lead risk factors, based on 2000 Census data.**

| | Built <1950 | Built <1960 | All Homes |
|---|---|---|---|
| **# Housing Units in year 2000** | 560,322 (27%) | 810,152 (39%) | 2,065,946 |
| **# Children in Minnesota < 72 mo. (5 yr. period)** | 180,000 | 330,000 | 660,000 |
| **# Enrolled in Medicare (5 yr. period)** | 44,000 | 63,000 | 160,000 |

The following responses to an elevated blood lead report are outlined in Minnesota Statute (MS 144.9504) and the MDH Childhood Blood Lead Case Management Guidelines for Minnesota (updated in 2006):

- ✓ If levels are less than 10 µg/dL, information is entered into the surveillance database, and no additional follow-up is recommended (although partners may offer education and follow-up).
- ✓ If levels in children are 10 µg/dL or greater, follow-up or confirmation testing and educational intervention are called for. This includes giving the children's parents or guardian a letter, bringing in the child for follow-up or confirmation testing, and providing information on how to reduce and/or avoid exposure to lead in the environment.
- ✓ If venous lead levels in a pregnant woman are 10 µg/dL or greater or are 15 µg/dL or greater for children, environmental follow-up is required. This includes a housing risk assessment and may also include an education

visit from a public health nurse, enforcement orders, lead hazard reduction or remediation, and clearance testing.

- ✓ Levels of 60 µg/dL or greater indicate a medical emergency, and immediate action is taken.

Although Minnesota has mandatory reporting from all facilities analyzing blood lead levels, blood lead testing is not universal, and the data collected by the surveillance system are not representative of all Minnesota children. Data are collected only when a health care provider orders a blood lead test or a child is screened in the community by request of the parent or guardian. The percentage of children tested varies greatly from county to county and from year to year.

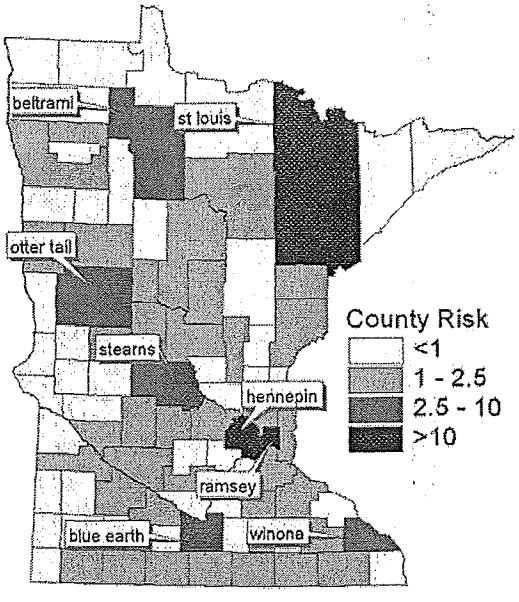
Based on 2007 data, 25 percent of the children in the Minnesota blood lead surveillance database reside in large cities even though these cities contain only 15 percent of the state population. Therefore, the database contains fairly reliable information on the prevalence of lead poisoning in urban areas of Minnesota. Evidence shows, however, that some populations statewide are clearly at risk. For example, it is estimated that 60 percent of the Medicaid-eligible population in Minnesota did not receive a blood lead test in 2007. Although ongoing data matching shows that this trend is improving (83 percent did not receive a blood lead test in 1999), it remains well short of the goal of 100 percent screening in Medicaid populations. In addition, a study conducted in a representative rural area of Minnesota showed lead poisoning rates of 2.1 percent at or above 10 µg/dL and 0.7 percent at or above 20 µg/dL, which is slightly below the rate reported to the MDH surveillance system but relatively consistent with national prevalence estimates.

*Statewide Lead Poisoning Risk Estimates*

In preparation for a CLPPP grant application in 2003, statewide data for lead risk was examined. It was found that the most important factors related to lead poisoning risk in Minnesota are the percentage of children in poverty and the percentage of homes built before 1950. Both of these characteristics were used, in conjunction with the population of children under six, to estimate the population-adjusted lead poisoning risk for individual geographic areas. For each geographic area the "County Risk" equals the number of children less than six years of age multiplied by the fraction of children in poverty multiplied by the fraction of homes that were built prior to 1950. The resulting number is NOT the expected number of EBLLs or percentage of EBLLs. It is simply a population-adjusted factor for comparing lead risk between counties or zip codes. Using the statewide county-level risk estimation, three counties have the greatest potential for lead poisoning (Figure 3). Of these, two counties contain the largest cities in Minnesota, Minneapolis (Hennepin) and St. Paul (Ramsey). Current state screening guidelines

**Figure 3:**

**Minnesota Relative Lead Risk by County**



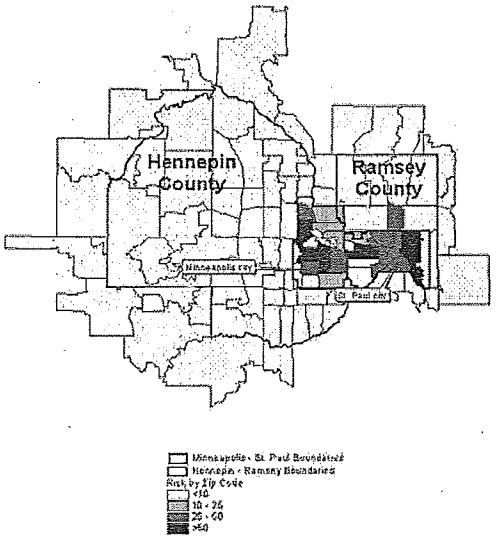
recommend screening of all children in Minneapolis and St. Paul at one and two years old. The other county at highest risk is St. Louis County, which contains the second largest urban area in Minnesota, the city of Duluth. Five counties are in the moderate category of lead poisoning risk (Beltrami, Otter Tail, Stearns, Blue Earth, and Winona). The remaining counties in Minnesota are at lower risk for significant numbers of lead-poisoned children.

Even within urban counties, most elevated blood lead tests are identified in Minneapolis and St. Paul. In 2007, 87 percent of the children with blood lead levels > 10 µg/dL, and 90 percent of the children with blood lead levels > 15 µg/dL in Ramsey county lived in St. Paul, and 83 percent of the children with blood lead levels > 10 µg/dL and 91 percent of the children with blood lead levels > 15 µg/dL in Hennepin county lived in Minneapolis.

In addition to statewide relative lead risk, city-specific data were examined in 2003 to more specifically determine the most at-risk areas for lead poisoning. Lead poisoning risk data by zip code for St. Paul and Minneapolis are presented in Figure 4. Both Minneapolis and St. Paul are classified as "cities of the first class" and are therefore designated as assessing agencies by Minnesota Statute and are responsible for lead risk assessment and case management. Local data show that elevated test results in Minneapolis tend to concentrate in the Near North and Phillips Communities. Near North is one of the poorest in the City, has the greatest number of subsidized housing units, and is home to the highest ratio of Minneapolis' children under age six. Most families are below the 80 percent poverty level, and are eligible for Medicaid programs. Nearly 90 percent of the housing stock in the Near North Community was built prior to 1950, 52 percent are rental units, and 34 percent of housing is classified as "Below Average."

**Figure 4:**

**Mpls./St. Paul Relative Lead Risk by Zip Code**




The City of St. Paul is divided into more than 80 individual census tracts. During the past five years, one or more children residing in 56 of these census tracts have been identified as having an elevated blood lead level. Of these 56 census tracts, a single census tract in the Thomas-Dale neighborhood has nearly twice as many elevated blood lead cases as the other 55. The age and condition of housing within this target area is very consistent. Nearly 90 percent of the homes were built prior to 1940. Local data indicates that 95 percent of these homes contain lead based paint and 84 percent have deteriorated lead-based paint. This census tract is very near a major interstate. It has high levels of lead in the soil and many deteriorated houses throughout its neighborhoods.

In addition to housing-based lead, there has been a great deal of attention paid to other sources of lead in recent years. In Minnesota, this has included tracking recalls of

products with lead, passing legislation in 2007 banning lead in children's jewelry (see: https://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S1262.3.html&session=ls85 ), working on addressing lead in upland game shot and hunter-donated venison, providing national leadership on using lead-free wheel weights and fishing tackle, and raising awareness of lead in traditional/imported products in immigrant populations.

## Plan Evaluation and Modifications

The measures presented in the "Implementation Goals" table (pp. 15-37) are used as benchmarks for conducting ongoing evaluation of the Plan and developing new objectives and tasks. The MDH currently convenes the MCLEAN twice a year (generally in April and October) to review Plan progress and discuss any needed modifications to reach stated goals and objectives. An overview of progress on the Plan is a standard agenda item at all MCLEAN meetings, as is information about successful strategies and barriers to progress. Additional meetings with Advisory Members are called as needed to review and update specific Goals. For the 2008 version of the Plan, an additional evaluation effort (see "Harvard Evaluation Effort" below) was used to assess specific portions of the Plan.

A bi-annual evaluation of the Plan (most recently completed in 2007) assessing progress towards goals and objectives is prepared and posted on the MDH Lead Program Web site at www.health.state.mn.us/divs/eh/lead.

*Harvard Evaluation Effort*

In 2007 MDH, in collaboration with the CDC Lead Branch and the Harvard School of Public Health, was invited to participate in an evaluation course titled "Program Evaluation: The Case of Lead Poisoning Prevention Programs." Other contributors included the Sustainable Resource Center (SRC), the Minnesota Housing Finance Agency, and the St. Paul-Ramsey County Department of Public Health. The course resulted in two Harvard MPH students producing recommendations for evaluating safe housing resources in Minnesota. Because housing-based lead remains the primary exposure route for Minnesota children, increasing the supply of lead-safe housing is essential to reaching the goal of elimination.

The goal of the Harvard safe housing resource evaluation was to examine the MCLEAN partnership in order to identify resources to increase the supply of lead-safe housing in Minnesota. A specific target, Goal IV in the Plan, was chosen by the Harvard students because several tasks within the goal are feasible but have yet to be accomplished. In order to efficiently administer the housing evaluation, ten uncompleted tasks related to lead-safe housing were selected from Goal IV. Tasks fall under four general areas:

| | |
|---|---|
| Area 1. | Electronic Resources |
| Area 2. | Capacity |
| Area 3. | Hazard Control |
| Area 4. | Funding |

Meetings were held on July 10 (Area 1), July 29 (Areas 2 and 3), and August 7 (Area 4), 2008 with targeted individual Advisory Members to review and discuss specific tasks in detail. Recommendations from these three meetings have been incorporated into the Implementation Goals table found at the end of this document. A model for the evaluation and all partners involved in the process, as published in the Harvard report, is presented in Figure 5 on the next page.

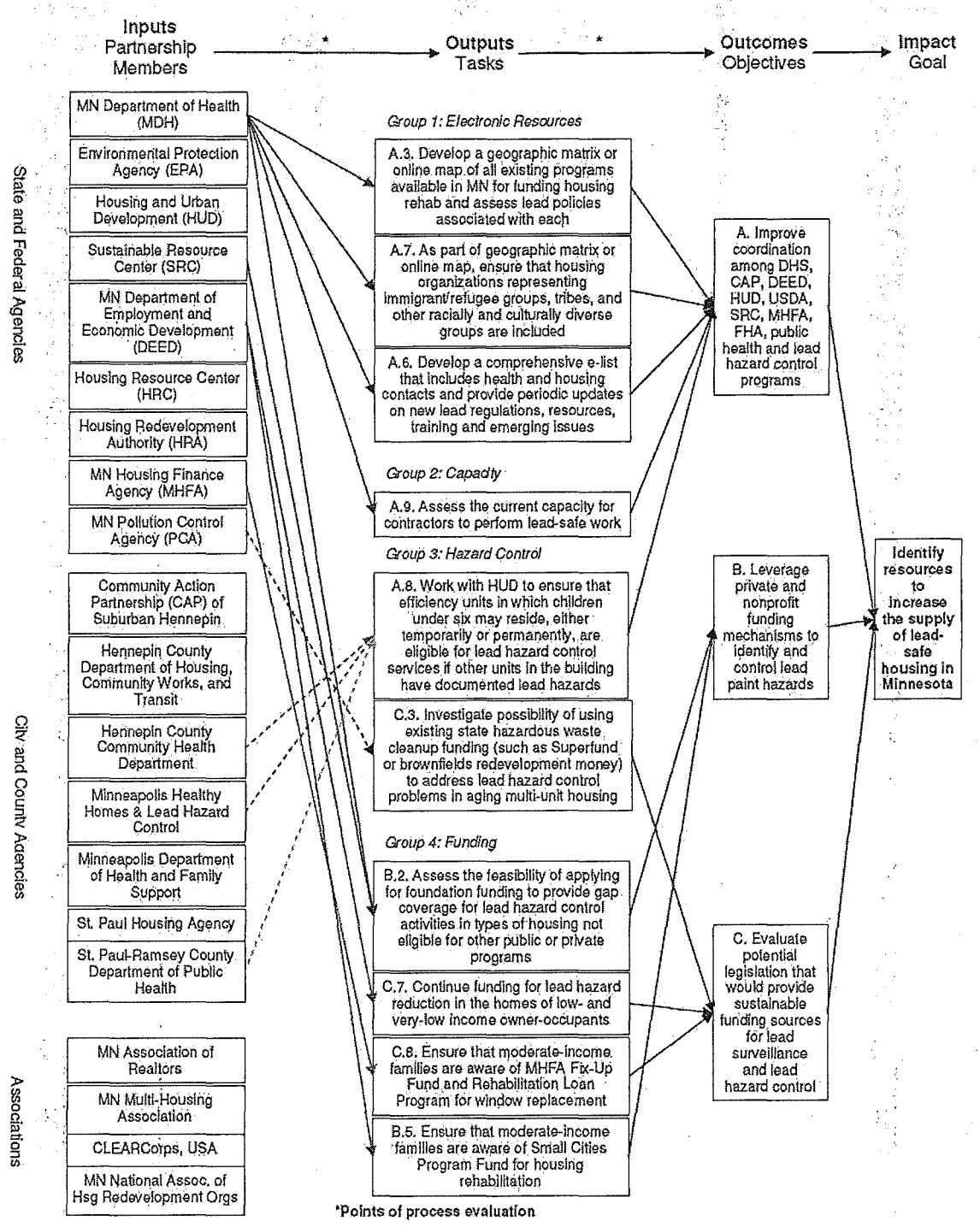
*MCLEAN Group Review and Comment*

In 2008, the Advisory Members also met to discuss possible revisions to the Implementation Goals. A series of meetings in the summer of 2008 gathered all the Advisory Members to review and amend each of the goals. Meetings on April 14 (which was the regularly scheduled MCLEAN meeting), May 21, and June 23, 2008 addressed all the remaining parts of the Plan that were not included in the Harvard discussions. Many written comments were also provided throughout the review/development period by a number of organizations. Recommendations and follow-up comments from all meetings have been incorporated into the Implementation Goals table found at the end of this document.

The updated Plan differs from the 2006 version of the Plan in several respects:

- The Advisory Members requested that task status be simplified to only three colors: red (for scheduled for later fiscal years), yellow (for in planning or implementation), or green (for completed or ongoing). All tasks were reassessed and assigned appropriate status colors.
- Specified funding for each task has been eliminated, since sources of financial support for childhood lead poisoning prevention activities can be fluid. However, a number of tasks were added/amended to help address possible sustainable sources of funding for lead poisoning prevention and lead hazard control.
- The Advisory Members reported several places in the Plan where tasks were redundant and requested consolidation of items. Advisory Members also requested removal of several tasks that were completed or deemed too problematic to implement. Therefore the number of individual tasks was reduced from 120 to 106.
- While the primary focus of the Plan remains housing-based lead, tasks were added to address the growing number of non-paint sources, including lead in children's jewelry, packaging, wheel weights, hunter-donated venison, and imported products.
- To enhance sustainability, tasks were examined in light of currently operating programs and amended to integrate ongoing activities as much as possible. This integration is especially important in light of the fact that 2010 is rapidly approaching and programs will likely need to sustain activities in the absence of additional funding.

## Figure 5: Safe Housing Resource Evaluation Model



This updated Plan also includes several elements recommended by the CDC in its review of the initial Plan in 2004:

- CDC recommended that the Plan contain prioritization of primary prevention efforts on properties with multiple EBLLs (Goal 2, Obj. C11), objectives for increased blood lead testing of children on Medical Assistance (Goal 2, Objs. A2, B1), and reimbursement by Medicaid of environmental case management (Goal 4, Obj. C2).
- CDC recommended targeting efforts in high-risk areas, and several Plan elements focus on the highest risk communities and populations.
- Measures are included for all Plan objectives and tasks.

Table 4 contains an overview of changes to individual goals between the 2006 and 2008 versions of the Plan. Specific tasks are found in the Implementation Goals table found at the end of this report.

**Table 4: Summary of changes to 2008 Plan compared to 2006 Plan based on recommendations from advisory members.**

| | |
|---|---|
| Goal I: Lead education and training | MDH will increase access to federal lead documents (i.e. EPA/HUD/CDC) by providing copies as requested; Surveys regarding using homestead applications and assessing statewide lead comprehension were deemed not practical; several tasks on reaching at-risk communities were combined into A5, A6, and A8; Guidance for test results <10 ug/dL was removed (completed task); Specific projects (NPCA training, St. Paul/Ramsey Co) are done and were removed |
| Goal II: Identifying at-risk properties and children | The CDC PAM is obsolete, therefore replaced with MEDSS in planning efforts; capacity for geo-coding, internet access has been upgraded; assessments now required on targeted housing projects using state funds; data matching agreements expanded; notice on Immunization Registry operational; research on insurance coverage not continued; provider education tasks consolidated; Lead Safe City model not deemed feasible |
| Goal III: Incorporating lead paint assessment and control into housing activities and infrastructure | Use of state building code was not deemed feasible for enforcement of lead exposure prevention; MDH does not oversee HUD grants from other organizations; consideration of state implementation of EPA RRP added; county tax assessors not a feasible outlet for promoting LSWP. |
| Goal IV: Identifying resources to increase the supply of lead-safe housing | DEED added as partner in state LSWP; MEDSS will be used to aid in data analysis/distribution; geo-coding efforts consolidated; additional training in LSWP will be targeted to CAPs; added review of Minneapolis ordinance on transient lead releases for possible passage in other jurisdictions; evaluating need for capacity to address multiple units in a building if lead risks documented; review of lead training to ensure coordination and efficiency; foundation funding actively pursued; awareness of Small Cities Program raised statewide; Medicaid funding for environmental assessments progressing; hazardous waste funding streams not a feasible resource for lead |
| Goal V: Emerging strategies based upon new research, legislation, trends, population conditions and other developments | Many tasks were reassigned to other parts of the Plan (e.g. A1, A2, B1) or combined into single tasks; MPCA added to "take home" education efforts; MDA and MDNR added to process for removing lead from products (e.g. venison); web links to banned products completed; promotion of the use of lead-free products added |

*Implementation*

The final draft of the 2008 version of the Plan was distributed to partners electronically for final review. The completed document will be placed on the MDH Web site for download after comments have been incorporated. It also will be distributed electronically to the MCLEAN email list.

An essential aspect of meeting goals and objectives related to eliminating childhood lead poisoning will be retaining current grants and funding sources, with special emphasis on HUD Lead Hazard Reduction programs. Minnesota currently has federal HUD lead hazard reduction or other awards to Minneapolis, Hennepin County, St. Paul-Ramsey County (this grant includes work in Duluth/St. Louis County), and to the Minnesota Department of Health (in collaboration with the DEED Small Cities program). When funding barriers are identified for various aspects of the Plan, available resources will be examined at the local, state, and federal level. In addition to ensuring sufficient funding to undertake primary prevention activities and core functions of the Lead Program, the Plan also must look to develop sustainable funding resources in the future.

The evaluation of Plan implementation will be reported to the legislature as part of the regular biennial MDH report (stipulated by Minn. Stat. 144.9509) on the Lead Program. This report is posted in several formats on the MDH Web site. It is next due in January 2009.

All available published literature and reports will be used, in conjunction with current surveillance, census, and other demographic data, as information sources for ongoing evaluation and amendment of the Plan. As adjustments are necessary, they will be presented at the MCLEAN meetings for discussion and approval. Upon reaching consensus, changes will be made to the Plan. All changes to the Plan will be noted on the MDH Web site and reported to CDC via semi-annual reporting as part of the CLPPP's responsibilities.

*General Comments Received*

There were many comments received verbally and in writing that addressed specific parts of the Implementation Goals on pp. 15 – 37 of this Plan. Those specific comments have been summarized in Table 4 above and incorporated in to the Plan as discussed in Harvard Evaluation and MCLEAN Group Review meetings.

A number of partners also submitted comments that addressed common themes throughout the document. For example, it was pointed out that there is growing evidence that blood lead levels of less than 10 ug/dL have significant impacts on children's development. While we have had great success at lowering lead levels in Minnesota, these new findings suggest that there is no "safe" level of lead for young children. Housing-based primary prevention efforts were strongly supported, along with promoting the use of non-lead products whenever practical, increasing training for LSWP and

general lead awareness in the general public, and continuing to use surveillance data to identify and target high-risk populations for lead education.

Several partners pointed out that lead education and lead hazard control work in Minnesota are almost entirely dependent on federal funding. Federal grant programs are competitive and subject to budget and policy changes, e.g. federal funding is moving beyond lead and toward broad healthy homes goals including lead. Under current conditions, if HUD funding were not available lead hazard control programs in Minnesota would basically cease, and education programs would be greatly curtailed

The general consensus of the Advisory Members was that there would continue to be large, long-term costs to the people of Minnesota if additional actions were not taken now to eliminate exposure to lead.

Childhood lead poisoning prevention has been a long-term priority of the MDH and partners across the State. While significant gains have been made, as shown through surveillance data, much remains to be done. The MDH Lead Program will continue to advocate for needed funds to ensure that children are protected from exposure to lead.

## The 2008 Goals for Elimination of Childhood Lead Poisoning by 2010

The updated Plan to eliminate childhood lead poisoning that is being released in 2008 contains the same fundamental five goals that were found in previous versions. The goals are:

I. Developing strategies for lead education and training.
II. Developing strategies for identifying at-risk properties and children.
III. Developing strategies to better incorporate lead paint assessment and control into housing activities and infrastructure.
IV. Developing strategies to identify resources to increase the supply of lead-safe housing.
V. Emerging strategies based upon new research, legislation, trends, population conditions and other developments.

Each of these goals, along with specific objectives, tasks and measures are presented in the Implementation Goals table below. The Plan continues to strongly advocate a collaborative, housing-based approach to primary prevention of childhood lead exposure, while still incorporating ongoing programs that are based on secondary prevention models. This is consistent with the federal elimination strategy to act before children are poisoned (primary prevention), intervene early when children have blood levels less than 10 µg/dL but rising (primary prevention), care for lead-poisoned children (secondary prevention), conduct research, and measure progress to refine lead-poisoning prevention strategies.

The role of the organization(s) listed under "responsibility to implement" is to develop models by completing new or ongoing projects that achieve the measurable outcomes or

to organize collaborating agencies to examine the issue and implement reasonable approaches. If a task involves a statewide aspect or requires transfer of successful approaches to other jurisdictions, generally a state agency is listed as one of those organizations responsible to implement. The MDH ALC Unit is responsible for overseeing statewide lead compliance activities consistent with EPA, HUD and state rules, while the MDH EIA Unit is responsible for operating the statewide surveillance database and coordinating education efforts consistent with CDC CLPPP funding requirements. The "MDH Lead Program" refers to the combined efforts of both the ALC and EIA Units.

The concept of "healthy homes" was discussed during advisory member meetings to best determine how it fits into plans for eliminating childhood lead poisoning. While it is acknowledged that lead poisoning prevention/elimination is an essential aspect of implementing any healthy homes initiative, MDH is still examining various models and implementation strategies for its statewide healthy homes efforts. Therefore, activities related to developing and implementing healthy homes strategies are not included in this Plan at this time. Future versions of the Plan will contain more specific details regarding the transition of lead programs in Minnesota to programs that more holistically address housing-based environmental health threats. The experience of currently operating healthy homes programs in Minnesota, including those conducted by the City of Minneapolis, the Sustainable Resources Center, and a number of state and local housing organizations, will be used as models.

## Acknowledgements

This Plan was the result of the hard work and dedication of the original workgroup and the advisory members, whose attention to detail and willingness to examine the complex and diverse issues underlying childhood lead poisoning has led to a comprehensive approach to eliminate lead as a pediatric health threat in Minnesota. Although designed as an inclusive Plan that crosses many administrative boundaries, the planning effort and writing was primarily conducted by MDH using support from the CDC Childhood Lead Poisoning Prevention Cooperative Agreement 5H64EH000138-03.

Completed or Ongoing | In Planning or Implementation | Scheduled for Later Fiscal Years

## State of Minnesota Childhood Lead Poisoning Elimination Plan
### *Implementation Goals – September 2008*

**Goal I.**
**Strategies for Lead Education and Training.**

**Objective A.**
**Increase awareness of and compliance with the Federal Pre-renovation Disclosure Law 406(b), 1018 Disclosure Law, and Renovation, Repair and Painting rule 402(c)(3) among targeted audiences and the general public.**

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A1. Provide information on 406(b) and 1018 in the form of "Protect Your Family from Lead in Your Home" EPA/CPSC/HUD brochure to local units of government, realtors, contractors, property owners, and outreach/housing venues. | ALL PARTNERS | MDH will provide and track copies of "Protect Your Family form Lead in Your Home" EPA/CPSC/HUD brochure as requested by June 2010. |
| A2. Provide information on 406(b) and 1018 at all events and exhibits attended by the general public. | ALL PARTNERS | All partners will provide the EPA/CPSC/HUD brochures at education, training and outreach venues by June 2010. |
| A3. Provide general information and presentations on 406(b), 1018 and RRP through building associations and other professional contractor groups. | MDH ALC Unit, DOLI, Building owners and managers associations, contractor groups | Provide presentations, information, and CEUs as requested. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A4. Conduct LSWP training through the Sustainable Resources Center or by subsidizing private training contractors to perform training. | SRC | SRC and private training contractors will offer eight-hour training for rehab and renovation contractors and CLEARCorps staff at least six times each year. |
| A5. Provide one-on-one education to at-risk families regarding 1018 disclosure requirements and options for noncompliance or retaliation. | PPL, MMHA, landlord associations | At-risk families will be aware of their legal rights and options when renting properties with potential lead hazards. |
| A6. Assess existing videos for rental property owners and develop a plan for reproduction/distribution by June 2010. | MDH ALC Unit, HRAs (for Section 8), NAHRO and MMHA | Currently available materials are reviewed and recommendations made at MCLEAN meetings |
| A7. Provide community and housing compliance education for first-time homeowners with general information about 406(b), 1018, RRP, and/or the EPA/CPSC/HUD brochure. | MDH ALC Unit, DEED, Statewide community education, MHFA | New home buyers attending community education and other "first home" events will receive information on lead by June 2010. |

| Objective B.<br>**Ensure that health care providers statewide know and follow current guidelines on blood lead screening, medical case management and treatment.** | | |
|---|---|---|
| **Tasks** | **Responsibility to Implement** | **Measure** |
| B1. Review, update and disseminate state guidelines for blood lead screening (children and pregnant women), case management and treatment. | MDH EIA Unit and consulting health provider partners | Guidelines will be reviewed and updated regularly and placed on the MDH Web site for use by partners. |
| B2. Target education and training on blood lead testing and case management to specific clinics in high-risk geographic areas (i.e., Minneapolis and St. Paul) in which testing rates are low. | MDH EIA Unit, Health Plans, DHS, SRC, Minneapolis Health and Family Support | Identify clinics in which testing rates are low by June 2009. Work with clinic managers to provide education and training on blood lead screening and case management by June 2010. Work with clinic managers in rural higher risk counties by June 2010. |
| B3. Educate physicians in high-risk counties about blood lead screening requirements for at-risk children. | MDH EIA Unit, Local Public Health departments | Provide information to physicians practicing in high-risk counties the current set of blood lead screening, case management and treatment guidelines by June 2010. |
| B4. Provide annual surveillance reports to health care providers to ensure that data trends, new information and analysis are available to them. | MDH EIA Unit | Surveillance reports are issued, posted on the MDH Web site in June of each year. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| B5. Ensure that health providers can consult with an experienced case manager on specific patients or problems. | MDH EIA Unit | State Case Monitor is available to assist local public health agencies and health providers on an ongoing basis. |
| **Objective C. Train property owners and contractors in lead-safe maintenance and work practices.** | | |
| C1. Continue to approve training courses and license/certify lead professionals. | MDH ALC Unit | All requirements for an EPA-delegated Compliance will be met. |
| C2. Develop tools for lead-safe training or education presentations for the "do-it-yourselfer" audience through hardware stores and other events. | EPA | Identify a local or national partner for lead education by June 2010. |
| C3. Collaborate in the implementation of outreach efforts described in C2 above | MDH ALC Unit | Distribute materials to targeted areas |
| **Objective D. Increase the supply of licensed and certified lead professionals, including lead sampling technicians.** | | |
| D1. Facilitate funding for or provide worker, supervisor, and sampling technician training. | MDH ALC Unit, DEED, Hennepin County, HUD, St. Paul/Ramsey County Public Health, SRC | Six trainings will be completed by June 2010. |
| D2. Provide on-the-job training to minority/small business contractors in lead-safe work practices. | St. Paul – Ramsey County Public Health, MDH EIA Unit, SRC | Four additional minority/small business contractors will have certified Lead Supervisors by June 2010. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| D3. Conduct semi-annual lead sampling technician training for certified home inspectors and truth-in-sale housing evaluators. | St. Paul/Ramsey County Public Health | At least 30 home inspectors and truth-in-housing evaluators will become lead sampling technicians annually. |
| **Objective E.**<br>**Provide messages to the general public that make the connection between childhood lead poisoning and lead paint in pre-1978 housing.** | | |
| E1. Develop a statewide public information campaign on primary prevention of childhood lead poisoning. | ALL PARTNERS | Campaign messages, materials will be ready for roll-out in January 2009, with assessment of results in June 2010. |
| E2. Adapt or develop educational materials that provide the basic message about primary prevention and are translated into multiple languages. | MDH | MDH translate lead fact sheets into Karen (Burmese refugee language) by June 2010. |
| E3. Maintain and enhance a comprehensive lead information Web site with material for both the general and professional audience. | MDH ALC Unit | The MDH Lead Compliance Web site will be updated as needed with new and updated information. |
| E4. Provide statewide, bi-cultural education on lead poisoning prevention and housing issues, along with cleaning services and instruction, to families with blood lead levels both above and below the 15 ug/dL intervention level. | SRC | Families statewide can access prevention information in English and Spanish by June 2010. Families access services, even if children's BLL is below the intervention level. |

Completed or Ongoing | In Planning or Implementation | Scheduled for Later Fiscal Years

## State of Minnesota Childhood Lead Poisoning Elimination Plan
*Implementation Goals – September 2008*

**Goal II.**
**Strategies for Identifying At-Risk Properties and Children**

**Objective A.**
**Continue to maintain and improve the statewide blood lead surveillance system.**

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A1. Complete formal evaluation of surveillance system annually. | MDH EIA Unit | Using the CDC's "Guidelines for Evaluating Surveillance Systems," the MDH CLPPP will evaluate annually. |
| A2. Complete data matching between blood lead information system (BLIS) and Medical Assistance data from the Minnesota Department of Human Services (DHS) annually. | MDH EIA Unit, DHS | The data match will be completed annually and will be reported in the annual surveillance report. |
| A3. Develop data sharing agreements with all interested health Plans to help identify gaps in blood lead screening or testing. | MDH EIA Unit, Health Plans | Develop data-sharing agreements with all interested health Plans by June 2010. |
| A4. Evaluate use of the MEDSS when it is released as a replacement for the BLIS system. | MDH EIA Unit | The MDH will decide on conversion to MEDSS by June 2009. |
| A5. Develop the capacity to geo-code blood lead surveillance data for use of local public health departments. | MDH EIA Unit, Hennepin County | Geo-coding will be available for Minnesota blood lead data by June 2010. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A6. Conduct data matching between the BLIS data and Hennepin County Lead Program to help ensure data accuracy and quality. | MDH EIA Unit, Hennepin County Lead Program | Conduct data matching on an ad hoc basis. |
| A7. Work with MDH MEDSS staff to achieve the goal of 100 percent electronic data reporting, ensuring that all results (including those less than 10 ug/dL) are provided in a timely manner. | MDH EIA Unit, MEDSS staff, reporting labs | Electronic reporting from one of the two remaining labs that report on paper will be available by June 2009. Greater than 95% of reporting will be done electronically by June 2010. |
| A8. Make blood lead surveillance data available to local public health departments via the Internet. | MDH EIA Unit, MEDSS staff | Internet access of blood lead data will be available to local public health departments by June 2010. |
| A9. Ensure that medical case managers have access to environmental investigation data to best work with children and families. | MDH ALC Unit, Medical Case Managers, Environmental Assessment Agencies, MEDSS staff | All medical case managers will have access to housing data pertaining to their cases by June 2009. |
| A10. Improve annual surveillance report with GIS and blood lead results from 5-9 ug/dL. | MDH EIA Unit | The state's annual surveillance report includes blood lead results of 5-9 ug/dL. GIS data will be integrated into the surveillance system by June 2009. |
| A11. Review professional literature to identify new risk factors for childhood lead poisoning and relay this information to partners. | ALL PARTNERS | Partners will relay information about new or emerging risk factors for childhood lead poisoning via the MCLEAN e-list and other formal and informal methods. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A12. Mail compliance reports to all labs reporting blood lead analysis to the MDH. | MDH EIA Unit | Compliance reports will be mailed to all reporting labs annually. |
| **Objective B.**<br>**Promote blood lead screening for at-risk children and pregnant women and increase compliance with existing screening, case management, treatment and pregnancy guidelines.** | | |
| B1. Promote blood lead screening of Medicaid/MA eligible children through the statewide immunization registry. | MDH EIA Unit, MDH Immunization Registry | A reminder to health care providers will flag Medicaid/MA eligible children for blood lead testing by June 2010. |
| B2. Continue DHS targets and incentive pay to health providers for complete Child and Teen Checkups (including blood lead screening) on Medicaid/MA eligible children. | DHS, C&TC, Health Plans | DHS will increase screening targets included in contract with health providers each year. |
| B3. Provide recommendations about incorporating lead screening and testing to interested WIC clinics. | MDH EIA Unit, MDH WIC Clinic Coordinator, Hennepin County, St. Paul – Ramsey County Public Health, Minneapolis Department of Health and Family Support | Recommendations supplied as needed. |
| B4. Develop plans to address corrective action orders issued to health providers that do not meet screening targets and continue contracts that provide incentives to health providers meeting C&TC targets. | DHS, Health Plans | All Plans will take steps to meet C&TC targets by June 2010. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| B5. Continue to develop targeted screening projects in Minneapolis, St. Paul and other areas with high-risk populations. | ALL PARTNERS. | All partners will work cooperatively to find opportunities to develop targeting screening projects. |
| B6. Conduct blood lead screening and education activities for high-risk children and pregnant women through licensed daycares, reproductive health services, and other community settings statewide. | ALL PARTNERS | All partners will work cooperatively to find opportunities to screen and educate children and pregnant women at high risk for lead poisoning. |
| B7. Encourage Health Plans and C&TC to promote initial and follow-up lead testing for Medicaid children. | MDH, DHS, Health Plans, Local Public Health departments | By 2010, 80% of Medicaid children receiving a well-child visit at ages 1 and 2 will receive a blood lead test. |
| B8. Encourage Health Plans to send a chart flag for lead testing (initial and follow-up). | Health Plans, SRC, C&TC | By 2008, 50 percent of clinics will include chart flags to remind about lead testing. |
| B9. Continue to match MDH blood lead surveillance data with MDH Refugee Health Data and track trends in the immigrant/refugee communities in Minnesota. | MDH EIA Unit, MDH Refugee Health, Hennepin County, immigrant/refugee groups statewide | Elevated blood lead levels among immigrant/refugee groups will be comparable to blood lead levels among Minnesota-born population by June 2010. |
| B10.Continue to raise awareness among health care providers about guidelines for blood lead screening, case management, treatment and pregnancy. | MDH EIA Unit | Screening, case management and treatment guidelines will be familiar to all health professionals dealing with children or pregnancy. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| B11. Educate health care providers (individuals or clinics) about mandatory screening. | ALL PARTNERS | Partners will identify at least five educational opportunities and MDH or partners will offer on-site education by December 2009. |
| B12. Investigate which insurance carriers or policies will not cover blood lead testing or other preventive health care. | ALL PARTNERS | Research and collect information by June 2010. |
| **Objective C.**<br>**Use data about housing age, population and income to identify properties that may have lead hazards, perform risk assessments and implement primary prevention.** | | |
| C1. Use GIS mapping to determine high-risk areas for lead exposure and children in need of blood lead testing. | Hennepin County Lead Program, MDH EIA Unit, Dakota County | Hennepin County and Dakota County will continue to provide GIS mapping within their jurisdictions. MDH CLPPP will integrate GIS capability into BLIS or convert to MEDSS by June 2009. |
| C2. Develop a statewide system to collect and analyze environmental case management data. | MDH Lead Program, Assessing Agencies, MEDSS | The MDH Lead Program will develop, in cooperation with partners, a basic reporting procedure by June 2009. |
| C3. Encourage Section 8 property owners to access technical assistance and funding resources available from state and local lead poisoning prevention programs if inspections identify lead hazards. | Local housing authorities | Information on technical and funding assistance for lead hazard control will be made available to Section 8 property owners in the Metro area by June 2010. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| C4. Work to educate tenants of multiple-unit buildings with known lead hazards about landlord responsibilities and enforcement options. | MDH, Housing Link, Community Stabilization, MMHA, Legal Aid | Tenants seeking assistance in weighing legal options to reduce lead exposure will have resources. |
| C5. Continue performing primary prevention risk assessments and dust wipe sampling in homes where children live. | SRC, HUD Lead Grantees, CDBG Grantees, Deferred Rehab Loan Prog. | All agencies will conduct primary prevention risk assessments as required. |
| C6. Conduct informational seminars for code enforcement officials and Section 8 inspectors to encourage referrals of at-risk housing occupied by young children to local lead programs. | St. Paul/Ramsey County Public Health, Assessing Agencies | Assessing agencies will develop relationships with code enforcement and Section 8 inspectors and provide information. |
| C7. Develop database to record properties that received lead hazard reduction through a HUD Lead Grant. | HUD Lead Grantees | Each HUD Lead Grantee will maintain a database of properties that received lead hazard reduction dollars by June 2010. |
| C8. Request lead hazard control funding from HUD through the Small Cities Development Program for eligible properties. | DEED, MDH Lead Program | The current SCDP grant will operate through June 2010. Another application will be made for HUD funding in 2010. |
| C9. Require lead risk assessments when state housing funds are used to renovate properties built before 1978. | MHFA | Renovation projects will comply with the policy established by MHFA requiring lead paint risk assessment. |
| C10.Analyze EBLL data to determine the locations of housing units that poison multiple children and focus primary prevention efforts on those units. | MDH Lead Program | Analyze data annually. |

Completed or Ongoing | In Planning or implementation | Scheduled for later fiscal years

# State of Minnesota Childhood Lead Poisoning Elimination Plan

*Implementation Goals – September 2008*

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| **Goal III.**<br>**Strategies to Better Incorporate Lead Paint Assessment and Control into Housing Activities and Infrastructure.** | | |
| **Objective A.**<br>**Ensure that lead paint inspection, control and compliance are integrated into housing code and policy.** | | |
| A1. Ensure that programs and properties receiving HUD funding are aware of and in compliance with current HUD policies on lead paint assessment, lead safe work practices, and disclosure laws. | HUD, HUD Grantees, DEED, MHFA | Lead paint issues in pre-1978 housing are addressed consistent with current policy. |
| A2. Integrate lead paint inspection and lead-safe work practices into statewide building and local maintenance code applying to pre-1978 housing. | MDH Lead Program, Minnesota Department of Commerce, Builders' Association of Minnesota, Minnesota Area Housing Code Officials | Lead paint assessment and lead-safe work practices will be integrated into statewide building and maintenance code by June 2010. |
| A3. Ensure that renovation and remodeling contractors are aware of the Renovation and Remodeling Rules. | EPA, MDH Lead Program, Contractor Groups, DOLI | Renovation and remodeling contractors will receive information about the RRP rules by June 2009. |
| A4. Encourage local governments to incorporate lead paint inspection and compliance responsibilities into Housing Inspection Departments. | MDH Lead Program, Association of Minnesota Counties, LUG, elected officials | Develop a model based upon City of Minneapolis inspections for use in other jurisdictions by June 2010. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A5. Develop a model for incorporating lead paint inspection, lead-safe work practices and disclosure into rental property licensing. | MDH Lead Program, LUG, elected officials | Various municipal and national models will be examined to develop a model pilot project to begin by June 2010. |
| A6. Encourage local housing inspection officials to become certified lead sampling technicians able to take samples, especially in rural areas where certified lead professionals are not as readily available. | MDH Lead Program, local housing inspectors, LUG | The number of lead sampling technicians in rural Minnesota will increase by 10 percent by June 2010. |
| **Objective B.**<br>**Ensure compliance with and enforcement of lead paint laws.** | | |
| B1. Provide compliance assistance to regulated parties and licensed entities. | MDH ALC Unit | The MDH provides ongoing assistance as an EPA-authorized program. |
| B2. Enforce lead licensing requirements and regulated lead work practices. | MDH ALC Unit | The MDH enforces regulated lead work practices and licensing requirements on an ongoing basis. |
| B3. Continue to provide information about and promote compliance with federal lead requirements e.g. HUD 1012/1013, 1018, EPA 406(b), OSHA, RRP. | MDH ALC Unit, housing and health authorities | Information about federal lead requirements will continue to be available to interested audiences. |
| B4. Develop Supplemental Environmental Project (SEP) proposals to make available as part of federal or state lead enforcement actions. | MDH ALC Unit, SRC, LUG | A plan will be developed and on file as of June 2010. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| B5. Develop legislative or administrative proposal to allow MDH to analyze blood lead data by location and provide the locations of multiple EBLL cases for compliance follow-up. | MDH EIA Unit, Minnesota Attorney General, U.S. Dept. of Justice, HUD, Minnesota Legislature | Continue to work within Minnesota Data Practices Act to assist in investigating housing with multiple EBLL cases. |
| B6. Examine issues related to the EPA RRP and proceed with State implementation if appropriate | MDH Lead Program | Collaborating partners are consulted with and needed rules/statutes are amended |
| **Objective C. Identify partners who inspect family housing (single and multi) and encourage them to implement lead paint assessment and lead-safe work practices policies.** | | |
| C1. Work to establish a partnership with the Department of Commerce to determine the feasibility of inspectors including the visual identification of deteriorated paint as part of their work write-ups, and including lead-safe work practices (by weatherization crews) in project specs. | MDH Lead Program, Dept. of Commerce, CAP agencies, Weatherization Programs | Meet with Commerce and survey CAP agencies to determine their current policies and willingness to work with lead programs by June 2010. |
| C2. Survey Truth in Housing programs to determine the feasibility of inclusion of visual identification of deteriorated paint surfaces as part of their services to customers. | MDH Lead Program, Minnesota Realtors Association, private inspection individuals and firms. | Develop relationships with realtors and inspectors to assess this approach by June 2010. |

Completed or Ongoing | In Planning or Implementation | Scheduled for Later Fiscal Years

# State of Minnesota Childhood Lead Poisoning Elimination Plan
## *Implementation Goals – September 2008*

**Goal IV.**
**Strategies to Identify Resources to Increase the Supply of Lead-Safe Housing in Minnesota.**

**Objective A.**
**Improve coordination among DHS, CAP, DEED, HUD, USDA, SRC, MHFA, FHA, public health and lead hazard control programs.**

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A1. Develop relationships with USDA and rural development agencies to incorporate lead-safe work practices into homeowner education that accompanies efforts to rehab properties for the elderly and very low-income families. | USDA, Rural Development Agencies, MDH | Explore homeowner education requirements for the USDA rural development agencies by January 2009. |
| A2. Continue to implement HUD lead hazard control requirements in all state-funded housing programs with a health and safety component. | MHFA, DEED | Implementation will continue in standard loan programs, deferred loan programs, home improvement programs and others. |
| A3. Explore the use of MEDSS at MDH for tracking and distribution of statewide environmental data on lead. | MDH Lead Program | Research and collect information for statewide collection and distribution of lead information using MEDSS by December 2009 |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A4. Ensure that HUD funding for lead hazard control activities is available statewide for qualifying families with children with blood lead levels of 15 ug/dL or greater. | MDH Lead Program, DEED, St. Paul – Ramsey County Public Health, Hennepin County Housing, City of Minneapolis Housing, and other cooperating partners. | Maintain all HUD grants in green light status. Apply for HUD funding during the current and future SuperNOFAs. |
| A5. Provide training to Community Action Programs to ensure Lead Safe Work Practices on window, rehab and weatherization programs. | Community Action Programs, MDH Lead Program, SRC and other partners. | Develop a mandatory one day class on Lead Safe Work Practices by January 2010. |
| A6. Develop a comprehensive e-list that includes health and housing contacts to ensure that housing organizations representing immigrant/refugee groups, tribes, and other racially and culturally diverse groups are aware of available lead resources. | MDH Lead Program, Housing Link, SRC | Develop an e-list from the MCLEAN list base and provide periodic updates beginning in July 2010. |
| A7. Develop an online, interactive map of the state displaying currently available local lead resources, including LPH contacts, LUGs, housing agencies and organizations, using existing internet links. | MDH Lead Program, Hennepin County, DEED, MHFA | Research and collect information for statewide matrix by June 2009. Hennepin County will develop an online map by June 2009 |
| A8. Review current Minneapolis ordinance regarding transient lead releases from rehabilitation work for possible implementation statewide | Minneapolis, MDH Lead Program, Minnesota Legislature | Ordinance reviewed, barriers identified, and enforcement mechanism identified. |
| A9. Expand enforcement authority to include Units in buildings where EBL cases found and reasonable cause identified for additional risk of exposure | MDH Lead Program, Landlord organizations, Assessing agencies | Enforcement mechanism identified, statute amended as needed |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A10. Assess the current capacity for contractors to perform lead-safe work. | MDH, Assessing Agencies, Certified lead trainers | Research and collect information on the number of trainings held, sorted by location; number of people trained and percentage of state with access to lead-safe workers by January 2010. |
| **Objective B.**<br>**Leverage private and nonprofit funding mechanisms to identify and control lead paint hazards.** | | |
| B1. Seek funding through AmeriCorps/CLEARCorps for lead hazard reduction and education in Minnesota. | SRC, MPCA | Continue applying for AmeriCorps/CLEARCorps lead hazard control and education funding. |
| B2. Assess the feasibility of applying for foundation funding to provide support for lead education and primary prevention efforts. | SRC | Applications to available foundations are submitted consistent with deadlines and required format. |
| B3. Develop relationships with volunteer, non-profit and for-profit developers, remodelers and remediators to educate on lead-safe work practices utilizing the EPA RRP rule. | Twin Cities Habitat for Humanity Chapter, other Habitat Chapters statewide, Project for Pride in Living, Hands on Twin Cities, Voluntary Groups statewide, LUG's, Council of Non-Profits, Small Cities, DEED, HUD, Hennepin County, MDH Lead Program | Gather information on volunteer, non-profit and for-profit developers, remodelers and remediators to determine where to disseminate information on lead-safe work practices by June 2009. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| B4. Ensure that moderate-income families within funded jurisdictions are aware of Small Cities Program Fund or other housing resources for housing rehabilitation. | DEED, MHFA, MDH Lead Program, Local housing agencies, Local Public Health departments doing case management of EBLs. | Ongoing programs meet recruitment levels and perform LSWP on all appropriate projects. |
| **Objective C. Evaluate potential legislation that would provide sustainable funding sources for lead surveillance and lead hazard control.** | | |
| C1. Track bills that are introduced in each Minnesota Legislative Session and provide impact analysis or technical assistance to authors. | MDH Lead Program, other partners with legislative interests | MDH will continue to track bills and provide analysis and assistance. |
| C2. Propose legislation permitting use of Medicaid funding for environmental risk assessment and case management. | DHS, City of Minneapolis, Hennepin County, others involved in Medicaid | Federal waivers will be pursued consistent with applicable procedures. |
| C3. Investigate the feasibility of providing funds from a tax reduction for lead hazard control work or a fee on retail paint. | Minnesota Legislature | Bill introduced in 2005, reintroduced in 2006. New bills tracked as needed. |
| C4. Develop sustainable long-term funding source for the statewide blood lead surveillance system by 2010. | Minnesota Legislature, MDH | Recommendations for sustainable funding options will be included in the biennial report to the legislature, deliverable in January 2009. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| C5. Include lead hazard control activities in applications for funding for Healthy Homes initiatives. | ALL PARTNERS | Monitor pending grant applications through EPA, CDC, HUD and other grant application information sites. |
| C6. Consider increasing funding for lead hazard reduction in the homes of low- and very-low income owner-occupants. | MHFA | Examine during preparation of next biennial budget during 2009 session how to increase funding with affordable terms and conditions for lead hazard reduction in the homes of low- and very-low income occupants. |
| C7. Ensure that moderate-income families are aware of MHFA Fix-up Fund for window replacement. | MHFA, ALL PARTNERS | Include information about available funds in general resources about housing funds for moderate income families. |
| C8. Ensure that efficiency units in which children under six may reside, either temporarily or permanently, are eligible for lead hazard control services if other units in the building have documented lead hazards. | Minnesota Legislature | Necessary bills drafted, funding sources identified, legislation introduced and passed. |

Completed or Ongoing | In Planning or Implementation | Scheduled for Later Fiscal Years

## State of Minnesota Childhood Lead Poisoning Elimination Plan
### *Implementation Goals – August 2008*

**Goal V.**
**Strategies to Respond to Emerging Issues, such as New Research, Legislation, Trends, Population Conditions and Other Developments.**

**Objective A.**
**Improve blood lead screening and testing through focused educational efforts with providers and insurers.**

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| A1. Revive partnership with institutes of higher education to provide education to students on the risk factors for lead poisoning and the screening guidelines. | MDH, St. Paul-Ramsey | MDH will approach an institute of higher education to revive the partnership by June 2010. |

**Objective B.**
**Reduce childhood lead exposures by educating adults with EBLLs or lead-intensive occupations about "take home" lead.**

| | | |
|---|---|---|
| B1. Provide information about the potential impacts of lead exposure during pregnancy to women in industries in which lead is used. | DOLI, MDH | Integrate lead-in-pregnancy information into communication planning process by June 2010. |
| B2. Work cooperatively to provide adults working in conditions of lead exposure with information about potential hazards via fact sheets. | MDH, DOLI, MPCA | MDH will work with DOLI and MPCA to provide workers in lead industries with fact sheets. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| **Objective C.**<br>**Develop methods to prevent children from exposure to lead-containing products.** | | |
| C1. Outline the critical path that would be followed by the State of Minnesota to remove lead-containing children's products from sale. | MDH, MPCA, Department of Commerce, MDA | Identify and publish the path to remove lead-containing children's products from sale by June 2010. |
| C2. Refer information about packaging used for children's products that includes lead to the MPCA for education, enforcement and recall. | ALL PARTNERS | MPCA will continue product recalls for lead-containing children's products. |
| C3. Develop or partner with a Web site that lists products or packaging with confirmed lead content exceeding CPSC guidelines for use by health care providers, merchants, lead professionals and the general public. | MDH, MPCA | MDH and MPCA will develop a plan by June 2010 to make lead product and packaging information available online. |
| C4. Promote the use of non-lead products and educate the public about the risks of lead use. | MDH, MPCA, MDA, MDNR | MPCA will consider legislative initiatives to phase out the sale of lead products where alternatives are available. |
| C5. Develop and implement procedures to characterize and identify risks from lead in donated venison programs. | MDH, MDA, MDNR | Education and exposure prevention measures in place by November 2008. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| **Objective D.**<br>**Encourage technologies for accurate, effective and cost-efficient lead detection, lead hazard control, lead clearance testing and surveillance.** | | |
| D1. Ensure that lead partners in Minnesota and other states are updated on progress in technologies that can break up lead paint using light pulses. | HUD | HUD will continue to test and evaluate light pulse lead removal technologies. |
| **Objective E.**<br>**Develop effective communication channels to reach immigrants/refugees and other populations at higher risk for lead poisoning.** | | |
| E1. Develop a pilot project to include lead-safe housing and education information in an affordable housing registry. | Hennepin County Housing, Housing Link | Henn. Co and Housing Link will include information for property owners and prospective renters by June 2010. |
| E2. Support an information phone line in cooperation with DHS allowing health-related questions in languages spoken by Minnesota's minority populations. | MDH, DHS | Continue to work among state agencies to develop a phone line in many languages. |

| Tasks | Responsibility to Implement | Measure |
|---|---|---|
| E3. Cooperate with faith communities to provide a "train the trainer" public health awareness event for immigrants/refugees who prefer receiving health information from respected members of their own communities. | MDH, SRC, CUHCC, Faith Communities, Parish Nurses | Continue to sponsor and participate in a minimum of two outreach events per year involving minority populations by June 2010. |
| E4. Continue working with non-English media outlets to develop public health programming regarding childhood lead poisoning or lead-safe work practices. | ALL PARTNERS | Research and develop at least four proposals by June 2010. |
| E5. Strengthen the Emergency Communication and Health Outreach (ECHO) Minnesota Collaborative to ensure a recognized channel for immigrants/refugees to receive emerging public health information. | MDH, St. Paul – Ramsey County Public Health, City of Mpls Healthy Homes and Lead Hazard Control, EPA, Health Plans | Promote and track ECHO DVD distribution by June 2010. |

# Appendix B

## 2005 Blood Lead Surveillance Report

# 2007 Blood Lead Surveillance Report


Environmental Health Division
Environmental Surveillance and Assessment Section
Environmental Impacts Analysis Unit
Childhood Lead Poisoning Prevention Program
P.O. Box 64975
St. Paul, Minnesota 55164-0975

For more information about lead, contact the
Lead Program at (651) 201-4620

If you require this document in another format,
such as large print, Braille, or cassette tape, call:
(651) 201-5000 ♦ 1-888-345-0823 ♦ MDH TTY (651) 201-5797

## Table of Contents

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## Introduction

This 2007 Blood Lead Surveillance Report describes the activities of the Minnesota Department of Health (MDH) Childhood Lead Poisoning Prevention Program (CLPPP) and the data resulting from the MDH Blood Lead Information System (BLIS) for the 2007 calendar year. The report contains a description of the trends in lead testing and elevated blood lead levels in Minnesota, and summarizes activities taking place in Minnesota to prevent childhood lead poisoning. The intent of this report is to provide information for lead poisoning prevention stakeholders in Minnesota, document activities of the CLPPP, and assist local efforts to prevent childhood lead poisoning, and is also a companion to the State of Minnesota plan to eliminate childhood lead poisoning by 2010.

## Lead poisoning

Although the toxicity of lead has been known for thousands of years, lead poisoning remains one of the most common environmental health threats to children. There are many sources of lead, such as soil contaminated from years of leaded gasoline, lead dust accidentally brought home from parents' workplaces and hobby areas, and imported candies, traditional remedies, pottery, and toys. However, deteriorated lead paint in homes is the primary source of lead for U.S. children today.

Lead paint is most often found in homes built before 1950, but may be found in any home built before 1978, the year lead paint was banned for residential use. More than 80 % of all homes built before 1978 in the U.S. have lead based paint. This correlates to nearly one million homes in Minnesota. Old homes with lead paint may be found in both urban and rural areas. Lead paint may deteriorate as visible paint chips, but is more commonly found as fine dust, identical in appearance to ordinary house dust. Lead-painted windows are a special problem because the action of raising and lowering the window creates lead paint dust that settles on floors and window wells, even when new paint is put over the old lead paint. Remodeling activities in old homes can create large quantities of lead dust that may be inhaled or ingested by all family members.

Children less than six years old, and especially ages one to three years, are most vulnerable to lead's toxicity due to their growing bodies, nutritional needs, mouthing behavior and spending time on the floor. Pregnant women and the developing fetus are also at risk because lead easily passes through the placenta to the fetus, and the changing nutritional needs of the mother cause release of lead stored in bone. The Centers for Disease Control and Prevention (CDC) and the Minnesota Department of Health (MDH) consider children and pregnant women to have elevated blood lead levels (EBLLs) if their blood test results are greater than or equal to 10 micrograms of lead per deciliter whole blood (µg/dL).

Certain populations of children are at increased risk of lead poisoning. For example, children enrolled in Medicaid or other medical assistance programs are more likely to live in older homes in poor condition, have poor nutrition, and live in urban areas that may contain lead-contaminated soils. Refugees and immigrants are also at increased risk. They are likely to have

lead exposure in their home countries, may have poor nutritional status, and may live in substandard housing once in the U.S.

Recognizing and treating lead poisoning can be difficult because it often occurs with no distinct symptoms. In young children, the effects of low levels of lead may not appear until the children enter school and display learning difficulties, reduction in IQ, or behavior problems. At that point it is too late for prevention of lead poisoning and the effects are likely to be permanent.

Minnesota statute 144.9504 mandates environmental interventions for venous blood lead levels of 15 μg/dL or greater in children less than six years old. For levels of 10 μg/dL or greater, local public health nurses work with families to bring down elevated lead levels. For most children and adults with lead poisoning, identification and elimination of the source of lead is the main treatment. Chelation to quickly reduce the blood lead level is advised only for blood lead levels of 45 μg/dL or greater. Research has shown no benefit in long-term outcome for chelation of blood lead levels less than 45 μg/dL. For this reason, primary prevention, or preventing lead poisoning before it can start, is crucial.

## 2010 Lead Poisoning Elimination Plan

In 2004 a workgroup consisting of partners from federal, state, and local governments, community based organizations, housing, real estate, landlord, and tenant organizations, and many other disciplines, created the State of Minnesota 2010 Childhood Lead Poisoning Elimination Plan. The stated goal of the plan is: "To create a lead-safe Minnesota where all children have blood lead levels below 10 μg/dL by the year 2010." The plan advocates for a collaborative, housing-based approach to promoting primary prevention of childhood lead exposure, while incorporating ongoing programs at both the state and local level. This is consistent with the federal strategy to act before children are poisoned, identify and care for lead poisoned children, conduct research, and measure progress to refine lead poisoning prevention strategies. Further information and the full plan are available at the MDH Lead Program website: www.health.state.mn.us/divs/eh/lead.

A progress report ("2010 Plan Year Three Progress Report, September 2007") is available from CLPPP at the Web site listed above. There has been substantial progress in achieving the strategies laid out in the original Plan and in incorporating new ideas into the current Plan. The CLPPP will be reissuing an updated plan during late summer 2008. During the April 14, 2008 meeting of the MDH-sponsored Minnesota Collaborative Lead Education and Assessment Network (MCLEAN), participants went over Goal IV of the plan in detail to update progress on individual goals and tasks, and to make suggestions for revision or elimination of tasks. Tasks related to increasing the supply of lead-safe housing were specifically evaluated by two students from the Harvard School of Public Health in winter 2008. Further evaluation activities regarding these tasks will take place in summer 2008. The remaining goals and tasks were evaluated during subsequent work group meetings on May 21, 2008 and June 23, 2008. The updated plan for 2008 will incorporate all the progress and revisions suggested during these meetings. The 2010 plan was also reviewed and discussed at the April 3, 2007 and October 4, 2007 meetings of

MCLEAN. Future MCLEAN meetings will allow collaborators to provide updates on the progress towards specific goals in the 2010 Elimination Plan.

## The MN Blood Lead Information System (BLIS)

MDH maintains a blood lead information system (BLIS) for the purpose of monitoring trends in blood lead levels in adults and children in Minnesota. Analyzing laboratories submit results to the MDH lead program, as mandated by Minnesota Statute 144.9502. The data are maintained in an Oracle platform, which allows for high data security, and is compatible with other current state agency systems for data transfer. As of January 1, 2008 the blood lead database contained 969,319 records of blood lead test results from 685,335 individual Minnesota residents dating back to 1992. The data are used to help identify populations at risk for elevated blood lead levels (EBLLs), to help ensure that screening services are provided to groups identified as having the highest risk of lead poisoning and to ensure that environmental and medical follow up are provided to children with EBLLs.

It can often take months for these data to be reported and processed into the MDH surveillance database. The CLPPP is addressing this issue by promoting use of electronic reporting formats, which allow for greater efficiency in handling large numbers of records. MDH now receives approximately 67 % of reports electronically, up from 27 % in 1997.

## Blood Lead Testing Methods Report to the Legislature

There have been ongoing questions in the lead community regarding the role of testing in lead poisoning prevention and appropriate testing methods. Therefore, the 2007 Legislature directed MDH to conduct a study to evaluate blood lead testing methods used to confirm elevated blood lead status. Specifically MDH was required to conduct a study to examine the false positive rate of capillary tests, current protocols for capillary testing, and guidelines from other states regarding lead testing, and directed MDH to make recommendations regarding the use of capillary tests to initiate environmental or medical interventions and make recommendations regarding reducing the state mandatory intervention level to 10 μg/dL. The full report is available here: http://www.health.state.mn.us/divs/eh/lead/reports/legislativerept07.pdf .

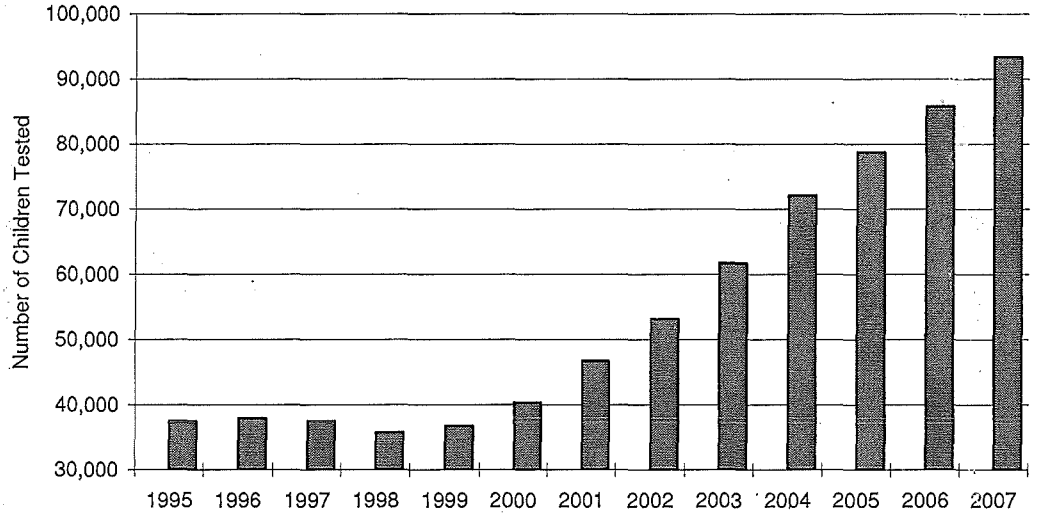
## Statewide surveillance data

The two main types of blood specimens used in blood lead testing are capillary and venous. Capillary blood specimens are drawn from a finger stick and the blood is collected either in capillary tubes or on filter paper. They are considered "screening" tests because they are prone to falsely high results due to surface contamination when hands are not properly washed with soap and water. However, capillary tests tend to be more acceptable to parents and may be performed in a wider range of settings. Venous specimens are considered "diagnostic" tests because they are drawn directly from a vein, but they can be less acceptable to some parents due to discomfort for the child, and necessitate greater expertise in drawing the blood.

Since not all Minnesota children have a high risk for lead exposure, targeted screening is currently recommended for most areas of the state, rather than universal screening. The goal is to test all children at risk for exposure to lead.

The number of children tested for lead in Minnesota has been increasing since 1998, with approximately 93,000 children tested in 2007 (Figure 1).

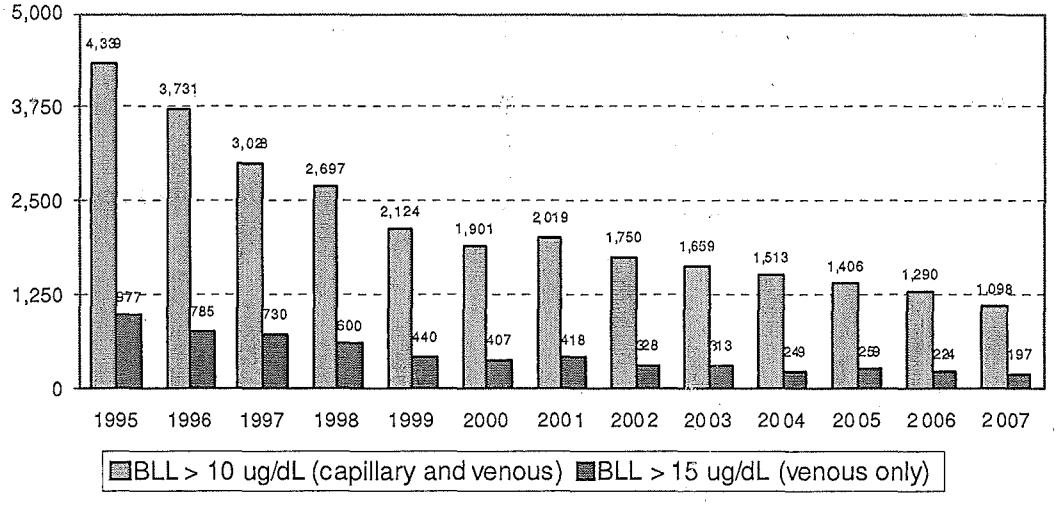
**Figure 1: Number of Children Tested (Less than 6 Years of Age)**




## Blood Lead Levels in Children

The trends in the number of EBLL cases in Minnesota children may also be compared across years (Figure 2). Fortunately the number of EBLL cases has continued to decrease. In 2007 there were 1,098 Minnesota children with blood lead levels of 10 µg/dL or greater, and 197 children had venous blood lead levels of 15 µg/dL or greater.

**Figure 2: Number of Children with Elevated Blood Lead Levels**




Blood lead testing and EBLL data have been summarized for each county in Minnesota, and are presented at the end of this report in Table 4.

### Case Management

The CLPPP provides technical assistance to all local public health agencies in the state of Minnesota to ensure case management services for children with elevated blood lead. These activities include:

- Assuring case management activities and follow-up testing for children and pregnant women that have EBLLS above 10 µg/dL are performed consistent with MDH guidelines;
- Communicating regularly with the Asbestos and Lead Compliance Unit to assess progress on open lead cases and facilitate communication between the Asbestos and Lead Compliance Unit and local lead case managers; and

Case monitoring activities have helped clinicians improve their adherence to Minnesota Guideline procedures.

### Follow-up Testing

MDH guidelines recommend follow-up blood lead tests for children with elevated blood lead levels. The period of time recommended for re-testing varies according to the initial blood level (see case management guidelines below), but the maximum time is 90 days for any child with a blood lead level of 10 µg/dL or greater. Of the 1,098 Minnesota children identified with EBLLs

in 2007, 625 (60%) received a follow-up test. Of these, 479 (44% of the total children with EBLLs) were retested within 90 days of their initial EBLL. Working to improve this low follow-up rate would reduce and mitigate the effects of children's lead exposure. Increasing the follow-up rate and reducing the time between tests will take the combined efforts of providers, case managers and the MDH Lead Program.

### Blood Lead Testing by County

County-specific data on blood lead testing and EBLL rates are provided at the end of this report in Table 4.

## Special populations

### Medicaid Children

National studies have shown that Medicaid-enrolled children are three times more likely to have elevated blood lead levels than non-enrolled children. Medicaid's Early and Periodic Screening Diagnosis and Treatment (EPSDT) program requires that well-child visits include blood lead testing at both 12 and 24 months. Despite the testing requirement, nationally only about 19% of Medicaid-enrolled children ages one to five were tested according to a 2000 report by the Government Accounting Office.

A joint study between the MDH Lead Program and Minnesota Department of Human Services (DHS) released in 2002 showed that children enrolled in Minnesota Health Care Programs (MHCP) had higher lead poisoning rates. Of those children tested between 1995 and 1998 and found to have EBLLs, 72% were enrolled in MHCP. MHCP children were nearly twice as likely as non-MHCP children to have EBLLs (9.8% compared to 5%). However, despite their high-risk status, only 13.3% of MHCP children were tested for blood lead in 1998.

The 9-30 month age group is used in analysis since this captures children tested around their one and two-year well-child visit as recommended in both DHS and MDH guidelines. Analysis of 1999-2003 data for Minnesota children enrolled in Medicaid funded programs provided good news about testing in the Medicaid-enrolled population, and was published in *Minnesota Medicine* in May 2006. The rate of blood lead testing in the total population of 9- to 30-month-old children enrolled in MHCP increased from 17% to 29% between 1999 and 2003. The rate of elevated blood lead levels EBLLs in tested children declined from 6% in 1999 to 2.7% in 2003. However, there remained a two-fold higher rate of elevated blood lead levels in MHCP children in 2003 (3.4% and 1.5% for MHCP and non- MHCP children, respectively). The percentage of children with elevated blood lead levels who were re-tested within three months increased from 39% in 1999 to 50% in 2003. To help sustain these gains, DHS continues to include provisions in their managed care contracts which encourage blood lead testing. A $30 incentive is provided for every child above the previous year's level of testing. DHS also includes a blood lead screening among the performance goals that must be met for health plans to receive the 5% of

their contract amount that is withheld at the beginning of each contract year. The Minnesota Medicine article is also available at www.mmaonline.net/publications/MNMed2006/May/clinical-zabel.htm in the May 2006, Volume 86 issue.

When combined with data from the report described above, the data for 2004 through 2007 also show a continuing trend toward higher rates of testing in MHCP-enrolled children (Figure 3), along with declining rates of EBLLs in both MHCP-enrolled and non-enrolled children (Figure 4).

**Figure 3. Children Enrolled in MHCP Tested for Blood Lead**

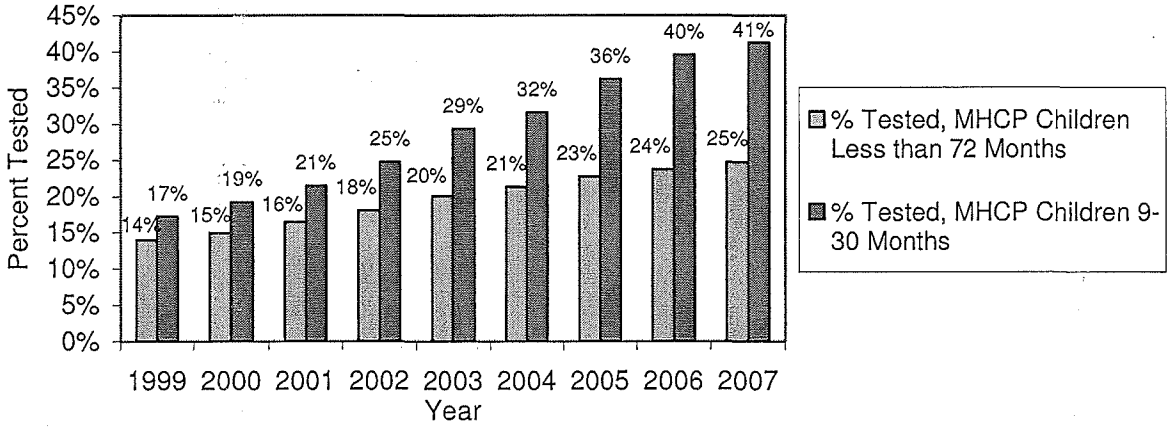
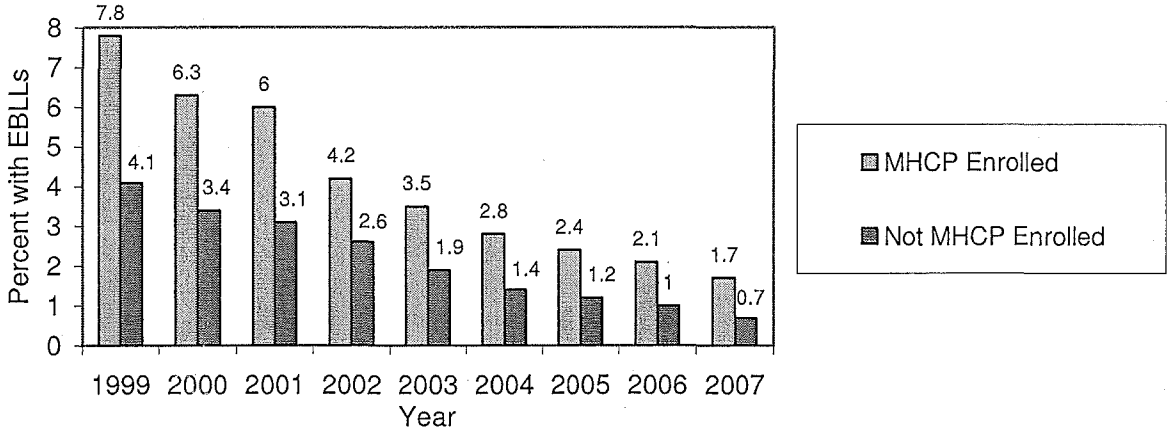



**Figure 4. Percentage of Tested Children Less than 72 Months Old with EBLLs**



### Refugee Children

Refugees are a population at high risk for lead poisoning. Refugees may have lead exposure in their countries of origin, such as use of leaded gasoline, herbal remedies, cosmetics or spices that contain lead, cottage industries that use lead in an unsafe manner, and limited regulation of emissions from larger industries. Once they are in the U.S., refugees frequently move into older, inner city housing, with potential for exposure to lead-based paint. The Division of Infectious Disease Epidemiology, Prevention, and Control at MDH collects demographic data on all refugees entering the state who receive an initial health screening. The 2007 refugee data were linked with the blood lead test results from BLIS to describe lead testing and EBLL rates in refugees. Refugee children in Minnesota comprise a wide range of ethnic origins, as shown in Table 1. Of all refugee children entering Minnesota in 2007, 94 % received health screening.

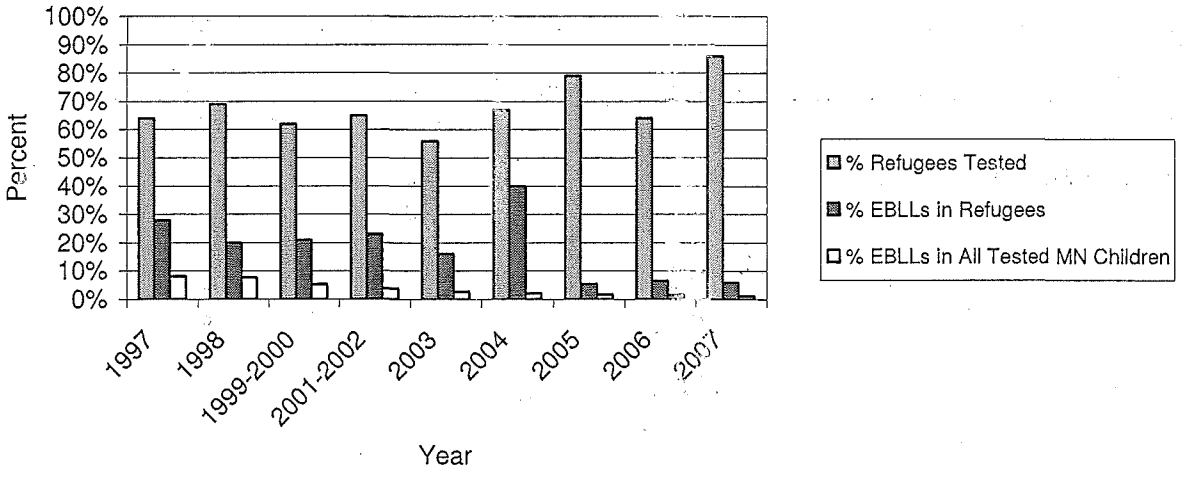
**Table 1. Number and Percent of Refugee Children (0-72 Months) Tested and with Elevated Blood Lead Levels in 2007 by Country of Origin**

| Ethnicity/ Region of Origin | # of Refugee Children* | # of Children Tested for Lead | | Of Children Tested for Lead, # Tested Within Three Months of Arrival | | Children w/Elevated Level (10 µg/dL) | |
|---|---|---|---|---|---|---|---|
| Burma | 93 | 89 | 96% | 87 | 98% | 7 | 8% |
| Ethiopia | 14 | 14 | 100% | 14 | 100% | 2 | 14% |
| Former USSR | 20 | 18 | 90% | 13 | 72% | 0 | 0% |
| Hmong/Laos | 10 | 7 | 70% | 6 | 86% | 0 | 0% |
| Liberia | 30 | 29 | 97% | 27 | 93% | 3 | 10% |
| Rest of Africa | 12 | 9 | 75% | 8 | 89% | 0 | 0% |
| Rest of Asia | 6 | 1 | 17% | 1 | 100% | 0 | 0% |
| Somalia | 53 | 49 | 92% | 47 | 96% | 0 | 0% |
| **Total** | **238** | **216** | **86%** | **203** | **94%** | **12** | **6%** |

*Data obtained from MDH Infectious Disease Epidemiology, Prevention and Control Division

Blood lead tests were also matched to refugee information in past years (Fig. 5). Of the children seen for an initial health screen in 2007, 97% were tested for blood lead. The rate of elevated blood lead levels for refugees has dropped in the past several years, but was still approximately five times the rate for blood lead tests statewide in 2007.

**Figure 5. Lead Testing and EBLLs in Refugee Children**




In early 2005, CDC issued new guidelines for blood lead testing in refugee children. These guidelines include lead testing for refugee children up through age 15, a repeat blood lead test after three to six months in the U.S., blood chemistry for iron status, use of pediatric multivitamins, and educational efforts for providers and families. These new guidelines were issued in response to a number of lead poisoning cases, including one death, in refugees in New Hampshire. In many of those cases, the children arrived with low lead levels, but were exposed to lead in the old homes in which they resided and absorbed this lead easily due to their poor nutritional status.

In response to these new guidelines, MDH Lead Program staff met with MDH Refugee Health Program staff to determine the feasibility of updating the recommendations for blood lead testing in refugees and to help raise awareness of educational materials in Somali. As a result of these meetings, MDH staff (both Refugee Health and CLPPP) decided to collaborate with the refugee health screening clinic at the St. Paul – Ramsey County Department of Public Health to conduct a pilot study to determine the feasibility of these recommendations. Some of the specific activities that occurred through this project were: testing blood lead levels in new refugee children aged 6 months through 15 years, performing complete blood count and blood chemistry for iron status, and obtaining follow-up lead tests on refugee children after three to six months in the U.S., even though their initial test was below the level of concern. Follow-up testing was performed to make sure their lead levels did not increase due to poor nutritional status when entering the country combined with lead exposure in the U.S. St. Paul - Ramsey Department of Public Health nurses followed up with parents and physicians on any test results that were of concern. Of the 150 children seen at the clinic, all received initial blood lead testing and 140 were tested a second time after living in the U.S. Initial EBLLs were observed in five of the children screened (3.3%), and only one child (0.7%) had a low initial test with an elevated second test. A full report was published in the March/April 2008 issue of *Public Health Reports*, and is available here: http://www.publichealthreports.org/userfiles/123_2/111-116.pdf.

Since spring 2007 the CLPPP has collaborated with the MDH Refugee Health Program on a national study to assess lead exposure and lead poisoning risk for new refugees in the U.S. The

study is directed by Dr. Paul Geltman of the Massachusetts Department of Health. Minnesota is serving as one of the study areas in which families of 30 refugee children will answer a lead risk survey and have a home lead hazard assessment performed. Minnesota data will be combined with data from other states to assess the risk of lead poisoning faced by refugees across the nation.

### Adults

CDC recommends a level of concern for adult exposure to lead of 25 µg/dL, while the Occupational Safety and Health Administration (OSHA) requires action in exposed workers at a level of 40 µg/dL. Minnesota's Adult Blood Lead Epidemiology and Surveillance (ABLES) program began identifying eligible adults on January 1, 1998. The total number of tests reported in 2007 for adults in Minnesota is presented in Table 2.

**Table 2: Minnesota residents 16 years or older with a reported blood lead test in 2007**

| # of reports | # of individuals | Range of reported results |
|---|---|---|
| 9,827 | 8,668 | 0.0 to 82.0 µg/dL |

There were 156 adults with BLLs of 25 µg/dL or greater identified through the ABLES program in 2007 (five female), and there were 14 adults with reported levels greater than 40 µg/dL (none female). Occupations and hobbies contributing to lead exposure are listed in Table 3.

**Table 3. Occupation/Exposure Categories for Adults with Elevated Blood Lead Levels**

| Occupation/Exposure | 25+ µg/dL | 40+ µg/dL |
|---|---|---|
| Painting | 1 | 0 |
| Construction and Demolition | 8 | 1 |
| Fishing Tackle Manufacturing | 16 | 0 |
| Lead Smelting | 90 | 8 |
| Stained Glass | 5 | 0 |
| Stone Product Manufacturing | 2 | 0 |
| Recycling | 7 | 2 |
| Shooting Firearms | 1 | 0 |
| Broke Open Car Batteries | 1 | 1 |
| Casting Fishing Sinkers | 1 | 0 |
| Retained Bullet from Gunshot | 2 | 0 |
| Home remodeling | 1 | 1 |
| Intentional ingestion | 1 | 1 |
| Unknown | 20 | 0 |
| Total | 156 | 14 |

## Evaluation of BLIS for 2007

In 2007 there were 114,310 total blood lead tests reported to the MDH BLIS. The tests were received from 56 separate laboratories; 41,342 (36%) received on paper through mail or fax and 72,967 (64%) received through electronic reporting (mailed disks, encrypted email, or secure website downloads). A total of 15,766 tests (14% of the total) were received from 33 clinics using ESA LeadCare analyzers. The tests received by MDH consisted of 82,669 capillary specimens (72%), 28,502 venous specimens (25%), and 3,139 tests of unknown type (2.8%). The median difference between specimen date (date the blood lead specimen was drawn) and date of analysis was one day. The difference between the date received at MDH and date of analysis had a median of 5 days, with a median of 6 days for paper laboratories and 4 days for electronic records laboratories. The time between received date and date of entry into BLIS had a median of 1 day for all tests, with a median of 0 days for electronic records and 10 days for paper records. The median total time between specimen date and entry date was 10 days, with a median of 21 days for paper records and 7 days for electronic. These data help indicate the advantages of electronic reporting. Electronic transfer of medical data significantly improves timeliness, in addition to requiring less staff time for entry of records into BLIS.

Data completeness is an important component of any surveillance system, and MDH staff make extensive efforts to ensure the most complete data possible in BLIS. Even after efforts to find missing addresses, they are still the most frequently missing component of data in blood lead tests reported to BLIS. Both city and zip code were missing 6.3% of the time, and street address was missing 6.9% of the time. The patient's date of birth was missing for 4 records, and these were all confirmed to be adult patients.

## State Blood Lead Guidelines

MDH has developed a set of four guidelines for lead: Childhood Blood Lead Screening, Childhood Blood Lead Case Management, Childhood Blood Lead Clinical Treatment, and Blood Lead Screening for Pregnant Women. These guidelines were developed by collaborative workgroups and have been endorsed by a range of professional health organizations. All four guidelines may be found at the MDH Web site at www.health.state.mn.us/divs/eh/lead. In addition to the guidelines from MDH, local public health agencies may review risk factors for elevated blood lead and the available blood lead screening data to assess concerns about lead poisoning in their areas. This will allow local agencies to develop interventions tailored to the risks in their areas. Factors to be considered locally are the age and condition of housing stock, the size of the population, screening practices of the area health care providers, occupational and community sources of lead, socio-economic status of the population and other unique risk factors in the community. The assessment should address the amount of screening that takes place relative to the size of the childhood population, the relative number of elevated cases that are found, and the use of other screening tools, such as questionnaires, to identify risk factors.

### Childhood Blood Lead Screening Guidelines

The MDH Childhood Blood Lead Screening Guidelines direct physicians to order blood lead tests for 1) children residing in specific geographic areas that have a high rate of cases of elevated blood lead; and 2) children matching specific demographic groups that have a high rate of elevated blood lead. Universal screening is recommended for children residing in Minneapolis and St. Paul and those recently arriving from other major metropolitan areas or other countries. Screening is also recommended for children receiving Medicaid. The test is typically performed when the child is one and two years old, but may be done at any time if the parent is concerned or if a high-risk activity (e.g. remodeling a home built before 1950) has recently occurred.

The screening guidelines were published in 2000. Since that time, EBLL rates have significantly dropped and primary prevention activities have increased in Minnesota. Therefore, the CLPPP convened a workgroup of stakeholders to formally re-evaluate the Blood Lead Screening Guidelines during fall 2007. Although EBLL rates in Minneapolis and St. Paul have decreased substantially since 2000, the group felt that given the education and outreach that has occurred over the past several years, the benefits of maintaining a universal testing recommendation for these two cities outweighed the benefits that might be gained by recommending targeted blood lead testing for these areas.

### Childhood Blood Lead Case Management Guidelines

The MDH Childhood Blood Lead Case Management Guidelines are intended to establish standardized, minimum levels of care for providing services to children with EBLLs. However, those counties that have greater resources available may wish to take a more rigorous approach to case management. The objective is to ensure that a qualified case manager is available to oversee the treatment and recovery of each child, and to ensure that steps are taken to prevent further exposure of the child to potential sources of lead. The Case Management Guidelines work in concert with the MDH Blood Lead Screening Guidelines for Minnesota to identify and manage lead exposure in children. Appropriate steps are presented for both capillary and venous test results.

### Childhood Blood Lead Clinical Treatment Guidelines

The Childhood Blood Lead Clinical Treatment Guidelines were designed for physicians to assist them in treating a patient with an EBLL, thus ensuring that all EBLL cases in Minnesota receive a consistent level of care. Although the current "actionable" level for lead case management and clinical treatment activities in Minnesota is 10 μg/dL, the CLPPP strongly supports providing guidance from public health and medical professionals to families with documented lead exposures below this threshold. Clinical treatment guidelines for blood lead levels less than 10 μg/dL were reviewed by a group of five physicians during 2005. Their consensus was that education should be provided and encouraged for children with blood lead levels of 5-10 μg/dL, but further clinical treatment is not required.

**Blood Lead Screening Guidelines for Pregnant Women in Minnesota**

In June 2004, MDH developed Blood Lead Screening Guidelines for Pregnant Women in Minnesota. They are designed for Ob/Gyn physicians, nurse practitioners, and midwives to assist them in screening and treating pregnant women for elevated blood lead levels, thus ensuring that both the women and their children receive intervention to reduce their lead exposure.

Prenatal lead exposure is of concern because it may have an effect on intellectual development. In addition to fetal risk, lead may be a risk to the mother; it has been shown to be related to cardiovascular disease. Lead is transferred from mother to the fetus because the placenta is a weak barrier to the passage of lead. Therefore, it may be assumed that fetal blood contains the same concentration of lead as maternal blood. The CDC and MDH consider 10 μg/dL and above to be an elevated blood lead level for pregnant women as well as children.

In many cases, high levels of lead in pregnant women arise from maternal occupational exposure. However, other lead exposures may occur, such as: remodeling a home containing lead paint that allows lead dust to become airborne and inhaled; a family member's occupation or hobby resulting in "take-home" lead; using non-commercial home remedies or cosmetics that contain lead; using glazed pottery for cooking; and pica behavior of the mother, such as eating soil or pieces of clay pots. There may also be exposure of the fetus to lead coming out of the mother's bones. This may arise from long-term previous exposures of the mother even though lead exposure is not happening during the pregnancy. Lead may come out of maternal bones faster during pregnancy and lactation because of the mother and fetus's need for calcium. A diet rich in iron and calcium may help reduce absorption of lead during pregnancy.

Not every woman is at risk for lead exposure, so a risk screening questionnaire should be used to decide when to test a pregnant, or potentially pregnant, woman for lead.

**Other information resources available from CLPPP**

The Lead Program maintains a web page through the MDH Web site that provides a number of lead education materials for providers, regulated parties, and the general public (www.health.state.mn.us/divs/eh/lead). This site contains information on hot topics (including current data, projects and requirements), numerous fact sheets, a list of "frequently asked questions" and responses, all publications and reports (including guidelines for screening, case management, and clinical treatment in children, and screening of pregnant women), a downloadable version of a lead education workshop, and links to many external lead resources.

The Lead Program posts relevant information to the MCLEAN group email list and encourages other state groups or individuals to post and respond to information.

In September 2004, ECHO (Emergency and Community Health Outreach) launched a first-of-its-kind television series on Twin Cities Public Television (tpt) Channel 17. An estimated 1.2 million households in the Twin Cities Metro area and western Wisconsin are covered by the signal. Every month, tpt broadcasts a 20-minute segment (hosted by members from ethnic communities) in six languages: Hmong, Khmer, Lao, Somali, Spanish and Vietnamese. Since

ECHO will broadcast live if a statewide crisis or emergency is underway, immigrant/refugee communities are familiar with the program and recognize its broadcasts as important to the health and safety of their families. ECHO is led by St. Paul-Ramsey County Public Health, Hennepin County Public Health, the Minnesota Department of Health, and other emergency preparedness agencies.

In late 2005, the CLPPP contracted with ECHO to get lead poisoning prevention messages out to non-English speaking populations. The shows about lead were taped in July 2006 and were broadcast in October 2006. DVDs of the production are available from CLPPP for use in education of non-English speaking populations. These productions are also available for viewing on ECHO's website at www.echominnesota.org. To date, MDH has distributed approximately 1,700 copies of the DVD.

## St. Paul Prevention Project

In fall 2006, the CLPPP contracted with Saint Paul/Ramsey County Department of Public Health to provide Lead Supervisor Training for four small contractors working in two targeted census tracts with high risk factors for childhood lead poisoning. Lead-safe work practices training was provided to at least 50 % of participating contractors' employees. Saint Paul/Ramsey County staff mentored and supported participating contractors during on-the-job implementation of lead-safe work in 16 homes with identified lead hazards. This effort continued in 2007, and the experiences of these contractors will be documented and summarized on the MDH Lead Program Web site.

## Lead in Venison

Many states have programs in which hunters may donate venison to food shelves by bringing their shot deer to meat processors, who provide the processed venison to food charities. In March 2008 a physician in North Dakota performed radiographic analysis on venison packages from food shelves in that state. A high percentage of the packages showed visible metal fragments on the X-ray images. Minnesota Department of Agriculture (MDA) staff obtained packages from Minnesota food shelves and performed similar analyses. The results were similar to North Dakota, with approximately 25% of packages showing fragments. Chemical analysis detected the presence of significant quantities of lead in the packages. As a result of this discovery MDA suspended venison distribution from food shelves in Minnesota. Currently MDH, MDA and the Department of Natural Resources (DNR) are working together to implement changes to the program for the Fall 2008 hunting season. Also, these three agencies are working to provide guidance for hunters and their families about consumption of venison, whether it is processed at home or by a commercial processor. More information will be available as the fall deer hunting season approaches, and will be available on the MDH Lead Program Web site.

## Further Lead Information

More information about lead poisoning prevention in Minnesota is available at the MDH Lead Program web site: www.health.state.mn.us/divs/eh/lead or by calling 651-201-4620.

**Table 4: Blood Lead Testing by County (Children Less than 6 Years of Age)**

| County | 5 to 9.9 µg/dL | | 10 to 14.9 µg/dL | | 15 µg/dL or greater | | Total Children Tested | | |
|---|---|---|---|---|---|---|---|---|---|
| | Venous | Capillary | Venous | Capillary | Venous | Capillary | All test types | Population < 6 years (2000) | Percent Tested |
| Aitkin | 0 | 24 | 0 | 1 | 0 | 0 | 258 | 858 | 30% |
| Anoka | 24 | 193 | 4 | 11 | 4 | 7 | 5,744 | 27,287 | 21% |
| Becker | 9 | 29 | 0 | 1 | 0 | 2 | 667 | 2,244 | 30% |
| Beltrami | 0 | 27 | 1 | 0 | 0 | 0 | 280 | 3,394 | 8% |
| Benton | 1 | 38 | 0 | 2 | 0 | 2 | 1048 | 2,949 | 36% |
| Big Stone | 0 | 7 | 0 | 0 | 0 | 1 | 77 | 336 | 23% |
| Blue Earth | 0 | 44 | 0 | 4 | 2 | 1 | 876 | 3,709 | 24% |
| Brown | 5 | 20 | 0 | 2 | 0 | 0 | 247 | 1,752 | 14% |
| Carlton | 1 | 52 | 0 | 3 | 0 | 2 | 721 | 2,266 | 32% |
| Carver | 4 | 31 | 1 | 1 | 0 | 2 | 1078 | 7,493 | 14% |
| Cass | 1 | 26 | 0 | 1 | 0 | 0 | 362 | 1,688 | 21% |
| Chippewa | 5 | 12 | 0 | 1 | 0 | 0 | 209 | 922 | 23% |
| Chisago | 5 | 33 | 2 | 4 | 1 | 1 | 788 | 3,750 | 21% |
| Clay | 0 | 30 | 1 | 1 | 0 | 1 | 642 | 3,826 | 17% |
| Clearwater | 0 | 1 | 0 | 0 | 0 | 0 | 47 | 594 | 8% |
| Cook | 0 | 1 | 0 | 0 | 0 | 0 | 31 | 292 | 11% |
| Cottonwood | 0 | 6 | 0 | 1 | 0 | 0 | 94 | 862 | 11% |
| Crow Wing | 4 | 109 | 0 | 10 | 1 | 4 | 1188 | 3,999 | 30% |
| Dakota | 42 | 294 | 3 | 26 | 7 | 12 | 6,582 | 33,353 | 20% |
| Dodge | 3 | 13 | 0 | 2 | 0 | 2 | 230 | 1,613 | 14% |
| Douglas | 0 | 35 | 0 | 2 | 0 | 0 | 548 | 2,216 | 25% |
| Faribault | 1 | 32 | 0 | 3 | 2 | 0 | 216 | 1,025 | 21% |
| Fillmore | 2 | 18 | 1 | 1 | 0 | 0 | 193 | 1,458 | 13% |
| Freeborn | 1 | 18 | 3 | 2 | 4 | 3 | 380 | 2,209 | 17% |
| Goodhue | 2 | 25 | 2 | 3 | 2 | 0 | 540 | 3,258 | 17% |
| Grant | 0 | 8 | 0 | 0 | 0 | 0 | 97 | 392 | 25% |
| Hennepin | 469 | 1,328 | 132 | 128 | 68 | 42 | 21,912 | 88,005 | 25% |
| Houston | 2 | 16 | 1 | 2 | 0 | 2 | 201 | 1,389 | 14% |
| Hubbard | 0 | 9 | 0 | 0 | 0 | 0 | 133 | 1,232 | 11% |
| Isanti | 3 | 34 | 1 | 2 | 0 | 1 | 688 | 2,497 | 28% |

| County | 5 to 9.9 µg/dL | | 10 to 14.9 µg/dL | | 15 µg/dL or greater | | Total Children Tested | | |
|---|---|---|---|---|---|---|---|---|---|
| | Venous | Capillary | Venous | Capillary | Venous | Capillary | All test types | Population < 6 years (2000) | Percent Tested |
| Itasca | 4 | 33 | 1 | 6 | 0 | 2 | 729 | 2,825 | 26% |
| Jackson | 0 | 5 | 0 | 0 | 0 | 0 | 93 | 723 | 13% |
| Kanabec | 0 | 17 | 1 | 1 | 0 | 0 | 183 | 1,116 | 16% |
| Kandiyohi | 14 | 44 | 1 | 5 | 0 | 4 | 926 | 3,080 | 30% |
| Kittson | 0 | 6 | 0 | 1 | 0 | 0 | 36 | 407 | 9% |
| Koochiching | 1 | 24 | 0 | 0 | 0 | 2 | 175 | 958 | 18% |
| Lac Qui Parle | 2 | 11 | 1 | 1 | 0 | 0 | 96 | 508 | 19% |
| Lake | 0 | 8 | 0 | 0 | 0 | 0 | 194 | 670 | 29% |
| Lake of the Woods | 0 | 9 | 0 | 0 | 0 | 0 | 64 | 244 | 26% |
| Le Sueur | 0 | 19 | 1 | 1 | 5 | 0 | 398 | 1,923 | 21% |
| Lincoln | 1 | 2 | 1 | 0 | 0 | 0 | 50 | 435 | 11% |
| Lyon | 0 | 29 | 0 | 1 | 2 | 1 | 513 | 2,009 | 26% |
| McLeod | 0 | 36 | 0 | 4 | 1 | 1 | 693 | 2,935 | 24% |
| Mahnomen | 2 | 1 | 0 | 0 | 0 | 0 | 73 | 453 | 16% |
| Marshall | 0 | 5 | 0 | 0 | 0 | 0 | 72 | 703 | 10% |
| Martin | 3 | 28 | 0 | 4 | 3 | 1 | 343 | 1,449 | 24% |
| Meeker | 1 | 17 | 1 | 3 | 0 | 1 | 367 | 1,760 | 21% |
| Mille Lacs | 1 | 15 | 0 | 3 | 0 | 1 | 397 | 1,648 | 24% |
| Morrison | 1 | 28 | 0 | 1 | 1 | 1 | 557 | 2,513 | 22% |
| Mower | 14 | 17 | 2 | 0 | 1 | 0 | 473 | 2,860 | 17% |
| Murray | 0 | 7 | 0 | 0 | 0 | 0 | 94 | 600 | 16% |
| Nicollet | 0 | 23 | 2 | 0 | 4 | 0 | 500 | 2,143 | 23% |
| Nobles | 0 | 34 | 0 | 5 | 0 | 3 | 527 | 1,736 | 30% |
| Norman | 0 | 2 | 0 | 0 | 1 | 0 | 56 | 556 | 10% |
| Olmsted | 13 | 47 | 2 | 3 | 4 | 3 | 1142 | 10,691 | 11% |
| Otter Tail | 2 | 14 | 0 | 0 | 1 | 1 | 418 | 3,772 | 11% |
| Pennington | 0 | 4 | 0 | 1 | 0 | 1 | 136 | 999 | 14% |
| Pine | 0 | 51 | 1 | 2 | 1 | 1 | 398 | 1,784 | 22% |
| Pipestone | 0 | 2 | 0 | 2 | 0 | 0 | 44 | 678 | 6% |
| Polk | 6 | 8 | 2 | 1 | 1 | 0 | 320 | 2,261 | 14% |
| Pope | 0 | 20 | 1 | 2 | 0 | 1 | 147 | 660 | 22% |
| Ramsey | 356 | 904 | 88 | 88 | 59 | 18 | 11,579 | 41,990 | 28% |

| County | 5 to 9.9 µg/dL | | 10 to 14.9 µg/dL | | 15 µg/dL or greater | | Total Children Tested | | |
|---|---|---|---|---|---|---|---|---|---|
| | Venous | Capillary | Venous | Capillary | Venous | Capillary | All test types | Population < 6 years (2000) | Percent Tested |
| Red Lake | 1 | 0 | 0 | 1 | 0 | 0 | 36 | 289 | 12% |
| Redwood | 3 | 12 | 2 | 3 | 1 | 0 | 251 | 1,252 | 20% |
| Renville | 2 | 19 | 1 | 1 | 0 | 1 | 283 | 1,260 | 22% |
| Rice | 4 | 65 | 2 | 2 | 4 | 1 | 1002 | 4,206 | 24% |
| Rock | 1 | 14 | 0 | 0 | 0 | 0 | 82 | 733 | 11% |
| Roseau | 0 | 5 | 0 | 0 | 0 | 0 | 122 | 1,460 | 8% |
| St. Louis | 20 | 271 | 11 | 18 | 7 | 9 | 3553 | 12,737 | 28% |
| Scott | 1 | 98 | 1 | 2 | 1 | 1 | 1,947 | 10,001 | 15% |
| Sherburne | 1 | 62 | 3 | 4 | 0 | 3 | 1,840 | 6,497 | 18% |
| Sibley | 3 | 18 | 2 | 2 | 1 | 1 | 235 | 1,227 | 4% |
| Stearns | 8 | 108 | 5 | 9 | 2 | 5 | 3,100 | 10,311 | 30% |
| Steele | 2 | 25 | 3 | 4 | 0 | 1 | 731 | 2,832 | 26% |
| Stevens | 1 | 11 | 2 | 0 | 0 | 0 | 120 | 631 | 19% |
| Swift | 2 | 14 | 0 | 0 | 0 | 1 | 141 | 775 | 18% |
| Todd | 1 | 38 | 0 | 1 | 0 | 1 | 408 | 1,743 | 23% |
| Traverse | 0 | 14 | 0 | 0 | 0 | 0 | 56 | 277 | 20% |
| Wabasha | 0 | 12 | 0 | 0 | 0 | 0 | 222 | 1,540 | 14% |
| Wadena | 2 | 10 | 0 | 0 | 0 | 0 | 196 | 1,014 | 19% |
| Waseca | 2 | 23 | 0 | 2 | 0 | 0 | 331 | 1,554 | 21% |
| Washington | 21 | 134 | 3 | 9 | 1 | 2 | 2,888 | 18,636 | 15% |
| Watonwan | 0 | 17 | 0 | 5 | 1 | 0 | 205 | 1,022 | 20% |
| Wilkin | 0 | 2 | 0 | 0 | 0 | 1 | 83 | 548 | 15% |
| Winona | 0 | 27 | 2 | 1 | 4 | 0 | 387 | 3,385 | 11% |
| Wright | 6 | 59 | 1 | 5 | 0 | 1 | 2,222 | 8,947 | 25% |
| Yellow Medicine | 1 | 16 | 0 | 2 | 0 | 0 | 158 | 757 | 21% |
| Unknown | 39 | 394 | 0 | 6 | 0 | 1 | 5,008 | N/A | N/A |
| Minnesota Totals | 1,126 | 5,451 | 295 | 426 | 197 | 179 | 93,477 | 397,581 | 24% |

# Appendix C

## Single-Page Summaries of Blood Lead Guidelines

# Childhood Blood Lead Screening Guidelines for Minnesota

## A Physician Should Test a Child at Any Age:

- If **the parent expresses a concern** about, or asks for their child to be tested for, blood lead poisoning
- If the child **moved from a major metropolitan area or another country** within the last 12 months

## Routine Screen:

Child health-care providers should **use a blood lead test*** to screen children at one and two years of age, and children up to six years of age who have not previously been screened if:

**The child lives within the city limits of Minneapolis or St. Paul;**

**or**

**The child receives services from Minnesota Care (MnCare), the Supplemental Food Program for Women, Infants, and Children (WIC), or Medical Assistance (MA) - which includes the Prepaid Medical Assistance Program (PMAP);**

**or**

**The child does not fit the criteria above, and the answer to <u>any</u> of the following questions is "Yes" or "Don't Know:"**

- During the past six months has the child lived in or regularly visited a home, childcare, or other building built before 1950?
- During the past six months has the child lived in or regularly visited a home, childcare, or other building built before 1978 with recent or ongoing repair, remodeling or damage (such as water damage or chipped paint)?
- Has the child or his/her sibling, playmate, or housemate had an elevated blood lead level?

## Periodic Evaluation:

In order to monitor a change in the child's status, administer the following questions annually to all children **three to six years of age** whose previous test results were less than 10 µg/dL. Screen the child with a blood lead test* if the answer to <u>any</u> of the following questions is **"Yes"** or **"Don't Know."**

**Since the child's last blood lead test:**

- Does the child have a playmate, housemate, or sibling who has recently been diagnosed with an elevated blood lead?
- Has the child moved to or started regularly visiting a home, childcare, or other building built before 1950?
- Has there been any repair, remodeling, or damage (such as water damage or chipped paint) to a home childcare, or other building built before 1978 that the child lives in or regularly visits?

* *A blood lead test for lead poisoning is a laboratory analysis for lead in the blood of a child or adult. An elevated blood lead test is a result greater than or equal to 10 micrograms lead per deciliter (µg/dL) of blood. Laboratories performing blood lead analysis are required to report all results to the Minnesota Department of Health.*

MINNESOTA MDH DEPARTMENT OF HEALTH

Division of Environmental Health
Environmental Surveillance and Assessment Section
Environmental Impacts Analysis Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

The following are general guidelines. For Childhood Blood Lead Clinical Treatment Guidelines for Minnesota, please call the MDH at (651) 201-4620, or visit our website at: *www.health.state.mn.us/divs/eh/lead/reports.*

# Follow-up Care

| If result of capillary screening test (µg/dL) is: | Perform diagnostic test on venous blood within: |
|---|---|
| 10-14.9 | 3 months |
| 15-44.9 | 1 week |
| 45-59.9 | 48 hours |
| ≥ 60 | **Immediately** (as an emergency lab test) |

### Follow-up testing for children with elevated diagnostic BLLs

- Children with diagnostic BLLs of 10-14.9 µg/dL should have at least one follow-up test within 3 months.
- If the result of the follow-up testing is ≥ 15 µg/dL, the child should receive clinical management, which includes follow-up testing.

### Clinical management includes

- Clinical evaluation for complications of lead poisoning.
- Family lead education and referrals.
- Chelation therapy, if appropriate.
- Follow-up testing at appropriate intervals.

### Provide appropriate chelation therapy

- A child with a BLL ≥ 45 µg/dL should be treated promptly with appropriate chelating agents and be removed from sources of lead exposure.

### Environmental Management

- Contact the Minnesota Department of Health/Local Public Health Agency.

# Sources of Lead

THE MOST COMMON SOURCES OF LEAD ARE PAINT, DUST, SOIL, AND WATER. OTHER SOURCES INCLUDE:

### Traditional Remedies/Cosmetics

IN ASIAN, AFRICAN, & MIDDLE EASTERN COMMUNITIES:
*As a cosmetic, or a treatment for skin infections or umbilical stump.*
- alkohl, kajal, kohl, or surma (black powder)

IN ASIAN COMMUNITIES:
*For intestinal disorders.*
- bali goli (round flat black bean)
- ghasard/ghazard (brown powder)
- kandu (red powder)

IN HMONG COMMUNITIES:
*For fever or rash.*
- pay-loo-ah (orange/red powder)

IN LATINO COMMUNITIES:
- some salt-based candies made in Mexico

*For abdominal pain/empacho.*
- azarcon (yellow/orange powder), also known as: alarcon, cora, coral, liga, maria luisa, and rueda
- greta (yellow/orange powder)

IN SOUTH ASIAN (EAST INDIAN) COMMUNITIES:
*For bindi dots.*
- sindoor (red powder)

*As a dietary supplement.*
- Ayurvedic herbal medicine products

### Occupations/Industries

- Ammunition/explosives maker
- Auto repair/auto body work
- Battery maker
- Building or repairing ships
- Cable/wire stripping, splicing or production
- Construction
- Ceramics worker (pottery, tiles)
- Firing range worker
- Leaded glass factory worker
- Industrial machinery/equipment
- Jewelry maker or repair
- Junkyard employee
- Lead miner
- Melting metal (smelting)
- Painter
- Paint/pigment manufacturing
- Plumbing
- Pouring molten metal (foundry work)
- Radiator repair
- Remodeling/repainting/renovating houses or buildings
- Removing paint (sandblasting, scraping, sanding, heat gun or torch)
- Salvaging metal or batteries
- Welding, burning, cutting or torching
- Steel metalwork
- Tearing down buildings/metal structures

### Hobbies/Miscellaneous

*May include above occupations.*
- Some children's jewelry
- Antique/imported toys
- Chalk (particularly for snooker/billiards)
- Remodeling, repairing, renovating home
- Painting/stripping cars, boats, bicycles
- Soldering
- Melting lead for fishing sinkers or bullets
- Making stained glass
- Firing guns at a shooting range
- Wild game shot with lead ammunition

*Funded by CDC Grant H64/CCH512780*

**www.health.state.mn.us/divs/eh/lead**
For more information about lead, contact the **Lead Program at (651) 201-4620**
**If you require this document in another format, call:**
(651) 201-5000 • 1 (800) 657-3908 • MDH TTY (651) 201-5797

*3/2000* ***(Last Updated 12/2008)***
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# Blood Lead Screening Guidelines for Pregnant Women in Minnesota

Prenatal lead exposure is of concern because it may have an effect on cognitive development and may increase delinquent and antisocial behaviors when the child gets older. Prenatal lead exposure may also reduce neonatal weight gain. In addition to fetal risk, lead may be a risk to the mother by causing an increase in blood pressure.

Lead is transferred from the mother to the fetus because the placenta is a weak barrier to the passage of lead. Therefore, it may be assumed that fetal blood contains the same concentration of lead as maternal blood. The Centers for Disease Control and Prevention (CDC) and the Minnesota Department of Health (MDH) consider 10 micrograms per deciliter (µg/dL) and above to be an elevated blood lead level for children.

In many cases, high levels of lead in pregnant women arise from maternal occupational exposure. However, other lead exposures may occur, such as: remodeling a home containing lead paint that allows lead dust to become airborne and inhaled; a family member's occupation or hobby resulting in "take-home" lead; using non-commercial home remedies or cosmetics that contain lead; using non-commercial glazed pottery for cooking; and pica behavior of the mother, such as eating soil or pieces of clay pots. There may also be exposure of the fetus to lead coming out of the mother's bones. This may arise from long-term previous exposures of the mother even though lead exposure is not happening during the pregnancy. Lead may come out of maternal bones faster during pregnancy and lactation because of the mother's and fetus's need for calcium. A diet rich in iron and calcium may help reduce absorption of lead during pregnancy.

Not every woman is at risk for lead exposure, so a risk screening questionnaire should be used to decide when to test a pregnant, or potentially pregnant, woman for lead.

# Blood Lead Screening Risk Questionnaire for Pregnant Women in Minnesota

Health-care providers should **use a blood lead test** to screen pregnant women if they answer, "yes" or "don't know" to any of the following questions, or if they have moved to Minnesota from a major metropolitan area or another country within the last twelve months:

1. Do you or others in your household have an occupation that involves lead exposure?
2. Sometimes pregnant women have the urge to eat things that are not food, such as clay, soil, plaster, or paint chips. Do you ever eat any of these things—even accidentally?
3. Do you live in a house built before 1978 with ongoing renovations that generate a lot of dust (for example, sanding and scraping)?
4. To your knowledge, has your home been tested for lead in the water, and if so, were you told that the level was high?
5. Do you use any traditional folk remedies or cosmetics that are not sold in a regular drug store or are homemade? (See list on back.)
6. Do you or others in your household have any hobbies or activities likely to cause lead exposure? (See list on back.)
7. Do you use non-commercially prepared pottery or leaded crystal?

MINNESOTA MDH DEPARTMENT OF HEALTH

*Environmental Health Division*
*Environmental Surveillance and Assessment Section*
*Environmental Impacts Analysis Unit – Lead Program*
*P.O. Box 64975*
*St. Paul, Minnesota 55164-0975*

**These guidelines have been reviewed and approved by the Minnesota Chapter of the American College of Obstetricians and Gynocologists (ACOG)**

The guidelines were based on the New York State Department of Health, *Lead Poisoning Prevention Guidelines for Prenatal Care Providers.*

# Sources of Lead

The most common sources of lead are paint, dust, soil, and water. Other sources include:

## Traditional Remedies/Cosmetics

IN ASIAN, AFRICAN, & MIDDLE EASTERN COMMUNITIES:
*As a cosmetic or a treatment for skin infections or umbilical stump.*
- alkohl, kajal, kohl, or surma (black powder)

IN ASIAN COMMUNITIES:
*For intestinal disorders.*
- bali goli (round flat black bean)
- ghasard/ghazard (brown powder)
- kandu (red powder)

IN HMONG COMMUNITIES:
*For fever or rash.*
- pay-loo-ah (orange/red powder)

IN LATINO COMMUNITIES:
- Some salt-based candies made in Mexico

*For abdominal pain/empacho.*
- azarcon (yellow/orange powder), also known as: alarcon, cora, coral, liga, maria luisa, and rueda
- greta (yellow/orange powder)

IN SOUTH ASIAN (EAST INDIAN) COMMUNITIES:
*For bindi dots.*
- sindoor (red powder)

*As a dietary supplement.*
- Ayurvedic herbal medicine products

## Hobbies

*May also include some of the occupations listed in the right column.*
- Bronze Casting
- Collecting, Painting or Playing Games with Lead Figurines
- Copper Enameling
- Electronics with Lead Solder
- Hunting and Target Shooting
- Jewelry Making with Lead Solder
- Liquor Distillation
- Making Pottery and Ceramic Ware with Lead Glazes and Paints
- Making Stained Glass and Painting on Stained Glass
- Melting Lead for Fishing Sinkers or Bullets or Lead Figurines
- Painting/Stripping Cars, Boats, and Bicycles
- Print Making and Other Fine Arts (When Lead White, Flake White and Chrome Yellow Pigments are Involved)
- Remodeling, Repairing, and Renovating Homes

## Occupations/Industries

- Ammunition/Explosives Maker
- Auto Repair/Auto Body Work
- Battery Manufacturing and Repair
- Bridge, Tunnel and Elevated Highway Construction
- Building or Repairing Ships
- Cable/Wire Stripping, Splicing or Production
- Ceramics Worker (Pottery, Tiles)
- Construction
- Firing Range Work
- Glass Recycling, Stained Glass and Glass Work
- Jewelry Maker or Repair
- Lead Abatement
- Lead Miner
- Leaded Glass Factory Worker
- Manufacturing and Installation of Plumbing Components
- Manufacturing of Industrial Machinery and Equipment
- Melting Metal (Smelting)
- Metal Scrap Yards and Other Recycling Operations
- Motor Vehicle Parts and Accessories
- Occupations Using Firearms
- Paint/Pigment Manufacturing
- Pottery Making
- Production and Use of Chemical Preparations
- Radiator Repair
- Remodeling/Repainting/Renovating Houses or Buildings
- Removing Paint (Sandblasting, Scraping, Sanding, Heat Gun or Torch)
- Steel Metalwork
- Tearing Down Buildings/Metal Structures
- Welding, Burning, Cutting or Torching

## Miscellaneous

- Antique/Imported Toys
- Chalk (Particularly for Snooker/Billiards)
- Imported Candy
- Imported Pottery
- Non-Commercially Prepared Pottery
- Non-Commercially Prepared Leaded Crystal
- Some Children's Jewelry

**www.health.state.mn.us/divs/eh/lead**

For more information about lead, contact the **Lead Program at (651) 201-4620**
**If you require this document in another format, such as large print, Braille, or cassette tape, call:**
(651) 201-5000 • 1-800-657-3908 • MDH TTY (651) 201-5797

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# Childhood Blood Lead Case Management Guidelines for Minnesota

(This document is intended for use by local public health agencies and their partners. It should be used in conjunction with the *Childhood Blood Lead Case Management Guidelines for Minnesota – Reference Manual*)

***REMINDER:*** *BLOOD LEAD SCREENING IS REQUIRED AT 12 AND 24 MONTHS FOR ALL CHILDREN RECEIVING MEDICAL ASSISTANCE (MA) (OR UP TO SIX YEARS OF AGE IF NOT PREVIOUSLY TESTED)*

| | **Capillary**<br>CAPILLARY TESTS ARE CONSIDERED A SCREENING TEST ONLY, VENOUS TESTS ARE CONFIRMATORY. | **Venous** |
|---|---|---|
| **< 10 µg/dL** | ▪ Provide educational materials* to the family. | ▪ Provide educational materials* to the family. |
| **According to Minnesota State Statute, all childhood blood lead levels ≥ 10 µg/dL are considered elevated.** | | |
| **10 -14.9 µg/dL** | **Within one month:**<br>▪ Provide educational materials* to the family.<br>▪ Contact the family with the recommendation to have a follow-up venous test.<br><br>VENOUS RETEST WITHIN THREE MONTHS | **Within one month:**<br>▪ Provide educational materials* to the family.<br>▪ Contact family with the recommendation to have a follow-up venous test within three months from the last blood lead test. |
| **15 – 44.9 µg/dL** | **Within one week:**<br>▪ Provide educational materials* to family.<br>▪ Contact the family to have a follow-up venous test.<br>▪ If feasible, contact the medical care provider regarding a follow-up venous test.<br>▪ Offer the medical care provider MDH's screening, treatment, and pregnancy guidelines.<br><br>VENOUS RETEST WITHIN ONE WEEK | ▪ **Within one week:** Arrange for initial home visit.** (in primary language when possible).<br>▪ Complete an in-depth assessment of: medical, environmental, nutritional, and developmental needs.<br>▪ Provide educational materials* to the family.<br>▪ Make necessary referrals.<br>▪ Communicate with the risk assessor assigned to the case.<br><br>Encourage the family to obtain a follow-up venous test *within three months* from the last test. Higher levels require more frequent monitoring.<br><br>Contact the family and/or medical care provider regarding the need for follow-up venous testing if venous follow-up not completed within three months from the last test. |
| **45 – 59.9 µg/dL** | **Within two business days:**<br>▪ Provide educational materials* to family.<br>▪ Contact the family to have a follow-up venous test.<br>▪ Contact the medical care provider regarding a follow-up venous test.<br>▪ Ensure that the medical care provider is aware of the screening, treatment, and pregnancy guidelines available from the MDH.<br><br>VENOUS RETEST WITHIN TWO BUSINESS DAYS | ▪ **Within two business days:** Arrange for initial home visit.** (in primary language when possible).<br>▪ Complete an in-depth assessment of: medical, environmental, nutritional, and developmental needs.<br>▪ Provide educational materials* to the family.<br>▪ Make necessary referrals.<br>▪ Attempt to facilitate alternative, lead-safe housing.<br>▪ Communicate with the risk assessor assigned to the case.<br>▪ Contact the medical care provider to determine blood lead level, medical status, treatment and follow-up plans.<br><br>At this level the medical care provider will most likely provide chelation therapy (see MDH treatment guidelines) and the child will need more frequent monitoring of their blood lead level. |
| **≥ 60 µg/dL** | **Immediately:**<br>▪ Provide educational materials* to family.<br>▪ Contact the family to have a follow-up venous test.<br>▪ Contact the medical care provider regarding a follow-up venous test.<br>▪ Ensure that the medical care provider is aware of the screening, treatment, and pregnancy guidelines available from the MDH.<br><br>VENOUS RETEST IMMEDIATELY | ▪ **Immediately:** Arrange for initial home visit.** (in primary language when possible).<br>▪ Complete an in-depth assessment of: medical, environmental, nutritional, and developmental needs.<br>▪ Provide educational materials* to the family.<br>▪ Make necessary referrals.<br>▪ Attempt to facilitate alternative, lead-safe housing.<br>▪ Communicate with the risk assessor assigned to the case.<br>▪ Contact the medical care provider to determine blood lead level, medical status, treatment and follow-up plans.<br><br>At this level the medical care provider will most likely provide chelation therapy (see MDH treatment guidelines) and the child will need more frequent monitoring of their blood lead level. **The child may be hospitalized at this level.** |

*Use suggested educational materials in the appropriate language (see *Childhood Blood Lead Case Management Guidelines for Minnesota – Reference Manual*). MDH lead educational materials are available by completing and sending in the order form at http://www.health.state.mn.us/divs/eh/lead/fs/index.html or by calling (651) 201-4610. Order EPA lead documents via the Internet at http://www.epa.gov/lead/nlicdocs.htm.

** When possible, it is recommended to complete at least one follow-up home visit.

# Sources of Lead

The most common sources of lead are paint, dust, soil, and water.
Other sources include:

### Products Used in Ethnic Communities

IN ASIAN, AFRICAN, & MIDDLE EASTERN COMMUNITIES:
*As a cosmetic or a treatment for skin infections or umbilical stump.*
alkohl, kajal, kohl, or surma (black powder)

IN ASIAN COMMUNITIES:
*For intestinal disorders.*
- bali goli (round flat black bean)
- ghasard/ghazard (brown powder)
- kandu (red powder)

IN HMONG COMMUNITIES:
*For fever or rash.*
- pay-loo-ah (orange/red powder)

IN LATINO COMMUNITIES:
- Some salt-based candies made in Mexico

*For abdominal pain/empacho.*
- azarcon (yellow/orange powder), also known as: alarcon, cora, coral, liga, maria luisa, and rueda
- greta (yellow/orange powder)

IN SOUTH ASIAN (EAST INDIAN) COMMUNITIES:
*For bindi dots.*
- sindoor (red powder)

*As a dietary supplement.*
- Ayurvedic herbal medicine products

## Hobbies

*May also include some of the occupations listed.*
- Bronze Casting
- Collecting, Painting or Playing Games with Lead Figurines
- Copper Enameling
- Electronics with Lead Solder
- Hunting and Target Shooting
- Jewelry Making with Lead Solder
- Liquor Distillation
- Making Pottery and Ceramic Ware with Lead Glazes and Paints
- Making Stained Glass and Painting on Stained Glass
- Melting Lead for Fishing Sinkers or Bullets or Lead Figurines
- Painting/Stripping Cars, Boats, and Bicycles
- Print Making and Other Fine Arts (When Lead White, Flake White and Chrome Yellow Pigments are Involved)
- Remodeling, Repairing, and Renovating Homes

## Miscellaneous

- Antique/Imported Toys
- Chalk (Particularly for Snooker/Billiards)
- Imported Candy
- Imported Pottery
- Non-Commercially Prepared Pottery
- Non-Commercially Prepared Leaded Crystal
- Some Children's Jewelry

## Occupations/Industries

- Ammunition/Explosives Maker
- Auto Repair/Auto Body Work
- Battery Manufacturing and Repair
- Bridge, Tunnel and Elevated Highway Construction
- Building or Repairing Ships
- Cable/Wire Stripping, Splicing or Production
- Ceramics Worker (Pottery, Tiles)
- Construction
- Firing Range Work
- Glass Recycling, Stained Glass and Glass Work
- Jewelry Maker or Repair
- Lead Abatement
- Lead Miner
- Leaded Glass Factory Worker
- Manufacturing and Installation of Plumbing Components
- Manufacturing of Industrial Machinery and Equipment
- Melting Metal (Smelting)
- Metal Scrap Yards and Other Recycling Operations
- Motor Vehicle Parts and Accessories
- Occupations Using Firearms
- Paint/Pigment Manufacturing
- Pottery Making
- Production and Use of Chemical Preparations
- Radiator Repair
- Remodeling/Repainting/Renovating Houses or Buildings
- Removing Paint (Sandblasting, Scraping, Sanding, Heat Gun or Torch)
- Steel Metalwork
- Tearing Down Buildings/Metal Structures
- Welding, Burning, Cutting or Torching

For more information about lead,
contact the **MDH Lead Program at (651) 201-4610**

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MDH TTY (651) 201-5797
Minnesota Relay Service TTY 1-800-627-3529

MINNESOTA MDH DEPARTMENT OF HEALTH

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# Childhood Blood Lead Clinical Treatment Guidelines for Minnesota[1]

| These guidelines were created for children from 6 to 72 months of age. | Blood Lead Levels in Micrograms Per Deciliter (µg/dL) | | | | |
|---|---|---|---|---|---|
| | **<10** | **10-14.9** | **15-44.9** | **45-59.9** | **≥ 60** |
| ***Medical Evaluation*** | | | | | |
| If capillary result, **confirm with venous draw** within: | | 3 Months | 1 Week | 48 Hours | IMMEDIATELY |
| Ask questions to identify sources of lead in the child's environment (age of home, condition of painted surfaces, pica, remodeling, occupations/hobbies, folk remedies, etc.) *Contact the MDH for a list of additional lead sources.* | X | X | X | X | X |
| Rule out iron deficiency and treat if present | | X | X | X | X |
| Complete diagnostic evaluation (history, labs, iron studies, physical exam) | | X | X | X | X |
| If exhibiting clinical symptoms check:<br>• Nutritional status (especially iron and calcium)<br>• Neurological and developmental status (especially language skills and concentration ability) | | | X | X | X |
| At this level check:<br>• Abdominal x-ray<br>Other diagnostic tests:<br>• BUN, CBC, Creatinine, UA and liver enzymes | | | | X | X |
| TREAT AS AN EMERGENCY - potential encephalopathy | | | | | X |
| ***Medical Management*** | | | | | |
| Anticipatory Guidance–discuss primary sources of lead poisoning and measures to keep children safe from lead; provide lead poisoning prevention literature | X | | | | |
| Assess for lead poisoning risk at every well-child visit | X | | | | |
| Educate family—discuss:<br>• Potential sources of lead and ways to reduce exposure; review and provide literature<br>• Dangers of improper lead abatement and/or remodeling<br>• Nutrition—encourage high iron/high calcium diet<br>• Chronic nature of problem (need to monitor frequently) | | X | X | X | X |
| Iron supplement if deficient | | X | X | X | X |
| IDENTIFY AND REMOVE LEAD SOURCE | | X | X | X | X |
| Persistently high levels in this range may require more aggressive treatment (consult MDH for information regarding chelation treatment) | | | X | | |
| Be sure to stop iron therapy prior to chelation | | | X | X | X |
| This level requires chelation—recommend the use of succimer per routine dosage (consult the MDH for further information if needed). | | | | X | X |
| In-home treatment indicated only in situations of:<br>• Lead-safe environment<br>• Highly compliant family<br>• Home health care monitoring | | | | X | X |
| Discharge inpatient cases ONLY to LEAD-SAFE ENVIRONMENT | | | | X | X |
| ***Follow-up/Comment[2]*** | | | | | |
| Review risk factors in 1 year | X | | | | |
| Screen other children in the home | | X | X | IMMEDIATELY | IMMEDIATELY |
| Repeat venous test in 3 months | | X | | | |
| Repeat venous test in 1 to 3 months (higher levels require more frequent monitoring) | | | X | | |
| Repeat venous and diagnostic tests 14 days **after** chelation therapy is complete. | | | | X | X |
| MDH or the local public health department will conduct an environmental inspection and public health nursing home visit for children up to 72 months of age. | | | X | X | X |

[1]Guidelines for clinical treatment of adults with elevated blood lead levels are available through the Minnesota Department of Health (MDH).
[2]Additional guidelines for public health case management of children are also available through the MDH.

MINNESOTA MDH DEPARTMENT OF HEALTH

Division of Environmental Health
Environmental Surveillance and Assessment Section
Environmental Impacts Analysis Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

# Childhood Blood Lead Clinical Treatment Guidelines for Minnesota[1]

## < 10 µg/dL

### Medical Evaluation
- Ask questions to identify sources of lead in the child's environment[2]

### Medical Management
- Anticipatory Guidance—discuss primary sources of lead poisoning and measures to keep children safe from lead; provide lead poisoning prevention literature
- Assess for lead poisoning risk at every well-child visit

### Follow-up/Comment[3]
- Review risk factors in 1 year

## 10-14.9 µg/dL

### Medical Evaluation
- If capillary result, **confirm with venous draw** within 3 months
- Ask questions to identify sources of lead in the child's environment[2]
- Rule out iron deficiency and treat if present
- Complete diagnostic evaluation (history, labs, iron studies, physical exam)

### Medical Management
- **Identify and remove lead source**
- Educate family—discuss:
  - Potential sources of lead and ways to reduce exposure; review and provide literature
  - Dangers of improper abatement/remodeling
  - Nutrition—encourage high iron/high calcium diet
  - Chronic nature of problem (need to monitor frequently)
- Iron supplement if deficient

### Follow-up/Comment[3]
- Screen other children in the home
- Repeat venous test in 3 months

## 15-44.9 µg/dL

### Medical Evaluation
- If capillary result, **confirm with a venous draw** within 1 week
- Ask questions to identify sources of lead in the child's environment (age of home, condition of painted surfaces, pica, remodeling, occupations/hobbies, folk remedies, etc.)[2]
- Rule out iron deficiency and treat if present
- Complete diagnostic evaluation (history, labs, iron studies, physical exam)
- If exhibiting clinical symptoms check:
  - Nutritional status (especially iron and calcium)
  - Neurological and developmental status (especially language skills and concentration ability)

### Medical Management
- **Identify and remove lead source**
- Educate family—discuss:
  - Potential sources of lead and ways to reduce exposure; review and provide literature
  - Dangers of improper abatement and/or remodeling
  - Nutrition—encourage high iron/high calcium diet
  - Chronic nature of problem (need to monitor frequently)
- Iron supplement if deficient
- Persistently high levels in this range may require more aggressive treatment (consult MDH for information regarding chelation treatment).
- Be sure to stop iron therapy prior to chelation

### Follow-up/Comment[3]
- Screen other children in the home
- Repeat venous lead in 1 to 3 months (higher levels require more frequent monitoring)
- MDH or the local public health department will conduct an environmental inspection and public health nursing home visit for children up to 72 months of age.

## 45-59.9 µg/dL

### Medical Evaluation
- If capillary result, **confirm with a venous draw** within 48 hours
- Ask questions to identify sources of lead in the child's environment (age of home, condition of painted surfaces, pica, remodeling, occupations/hobbies, folk remedies, etc.)[2]
- Rule out iron deficiency and treat if present
- Complete diagnostic evaluation (history, labs, iron studies, physical exam)
- If exhibiting clinical symptoms check:
  - Nutritional status (especially iron and calcium)
  - Neurological and developmental status (especially language skills and concentration ability)
- At this level check:
  - Abdominal x-ray
- Other diagnostic tests:
  - BUN, CBC, Creatinine, UA and liver enzymes

### Medical Management
- **Identify and remove lead source**
- Educate family (as in 15-44.9 µg/dL)
- Iron supplement if deficient
- This level requires chelation—recommend the use of succimer per routine dosage (consult the MDH for further information if needed).
- Be sure to stop iron therapy prior to chelation
- In-home treatment indicated only in situations of:
  - Lead-safe environment
  - Highly compliant family
  - Home health care monitoring
- Discharge inpatient cases ONLY to LEAD-SAFE ENVIRONMENT

### Follow-up/Comment[3]
- Screen other children in the home **immediately**
- Repeat venous and diagnostic tests 14 days **after** chelation therapy is complete.
- MDH or the local public health department will conduct an environmental inspection and public health nursing home visit for children up to 72 months of age.

## ≥ 60 µg/dL

### Medical Evaluation
- TREAT AS AN EMERGENCY - potential encephalopathy
- If capillary result, **confirm with a venous draw** IMMEDIATELY
- Ask questions to identify sources of lead in the child's environment (age of home, condition of painted surfaces, pica, remodeling, occupations/hobbies, folk remedies, etc.)[2]
- Rule out iron deficiency and treat if present
- Complete diagnostic evaluation (history, labs, iron studies, physical exam)
- If exhibiting clinical symptoms check:
  - Nutritional status (especially iron and calcium)
  - Neurological and developmental status (especially language skills and concentration ability)
- At this level check:
  - Abdominal x-ray
- Other diagnostic tests:
  - BUN, CBC, Creatinine, UA and liver enzymes

### Medical Management
- **Identify and remove lead source**
- Educate family (as in 15-44.9 µg/dL)
- Iron supplement if deficient
- This level requires chelation—recommend the use of succimer per routine dosage (consult the MDH for further information if needed).
- Be sure to stop iron therapy prior to chelation
- In-home treatment indicated only in situations of:
  - Lead-safe environment
  - Highly compliant family
  - Home health care monitoring
- Discharge inpatient cases ONLY to LEAD-SAFE ENVIRONMENT

### Follow-up/Comment[3]
- Screen other children in the home **immediately**
- Repeat venous and diagnostic tests 14 days **after** chelation therapy is complete.
- MDH or the local public health department will conduct an environmental inspection and public health nursing home visit for children up to 72 months of age.

[1] *Guidelines for clinical treatment of adults with elevated blood lead levels are available through the Minnesota Department of Health (MDH). These guidelines were created for children from 6 to 72 months of age.*

[2] *Contact the MDH for a list of lead sources.*

[3] *Additional guidelines for public health case management of children are also available through the MDH.*

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