

Minnesota's Lead Poisoning Prevention Programs

Biennial Report to the Legislature



February 2009

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As required by Minnesota Statutes, Section 144.9509

This report cost approximately \$3,000 to prepare, print, and distribute.

Printed on recycled paper.



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

Table of Contents

Table of Contents *i*

Executive Summary *ii*

Introduction..... *1*

Current State Lead Programs..... *1*

I. Surveillance Activities..... **2**

 A. Elevated Blood Lead Levels (EBLLs) in Minnesota 2

 B. Studies and Projects in At-Risk Populations 5

 1. Lead in Children Enrolled in Medicaid 5

 2. Lead in Minnesota Venison 7

 3. Lead in Refugees..... 7

 C. Screening and Case Management 9

 1. Blood Lead Guidelines 9

 2. Case Management 11

 D. Legislative Activities 11

II. Compliance Activities..... **12**

 A. Compliance Monitoring 12

 B. Special Projects 13

 C. Training Courses 14

 D. Legislative Activities 14

 E. MDH Compliance Inspections 15

III. Health Education and Outreach..... **16**

 A. Collaborative Workgroups..... 16

 B. Outreach 16

 C. Internet Resources 17

 D. Promoting Lead Awareness 18

Policy Planning and Program Evaluation..... *18*

 A. Data Quality Evaluation..... 18

 B. Childhood Lead Poisoning Elimination Plan 19

 C. Healthy Homes..... 20

Funding Status..... *21*

Future Directions..... *24*

Conclusions *25*

Appendices..... *26*

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 ($\mu\text{g}/\text{dL}$). 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 EBLs 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.

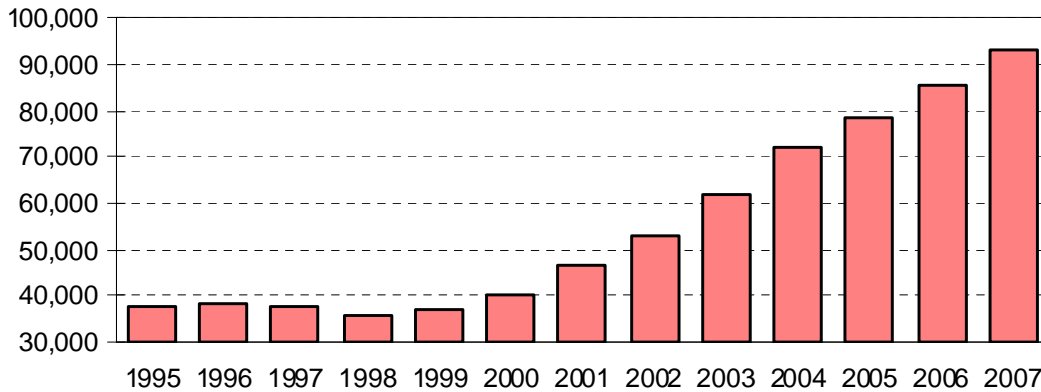
Specific conclusions cannot be drawn regarding the actual rates of lead poisoning in Minnesota based upon the data in BLIS. Since there is not universal testing among children across the state and testing is not conducted randomly, the tests reported to BLIS are not representative of the entire population 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%.

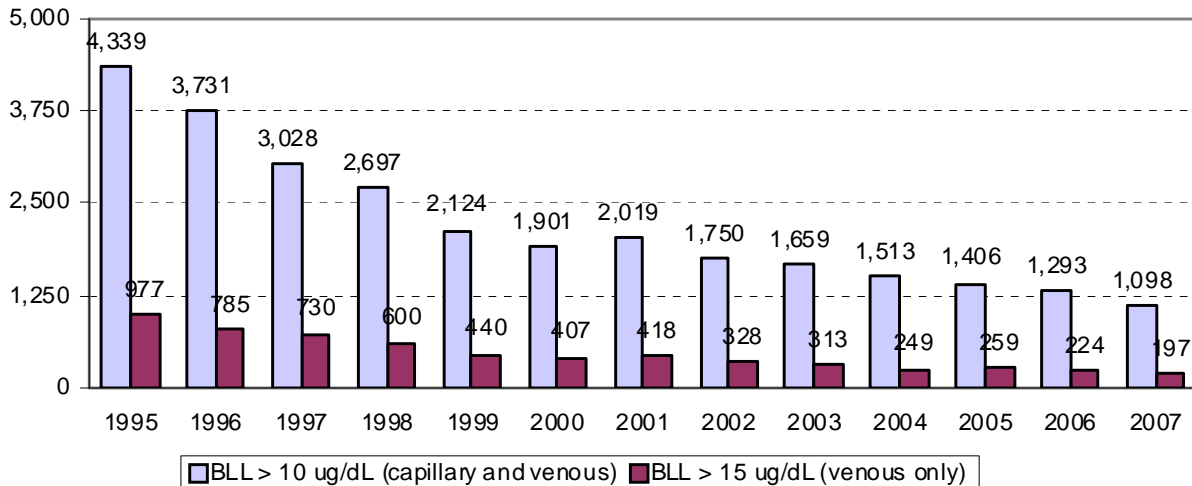
Figure 1. Number of Children Tested



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 EBLs may indicate that the amount of lead exposure is declining in Minnesota.

Rate of follow-up testing for children with EBLs

MDH guidelines recommend follow-up blood lead tests for children with EBLs. 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 EBLs in 2007, 625 (60%) received a follow-up test. Of these, 479 (44% of the total children with EBLs) were retested within 90 days of their initial EBL. Working to improve this follow-up rate would best serve children with EBLs 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

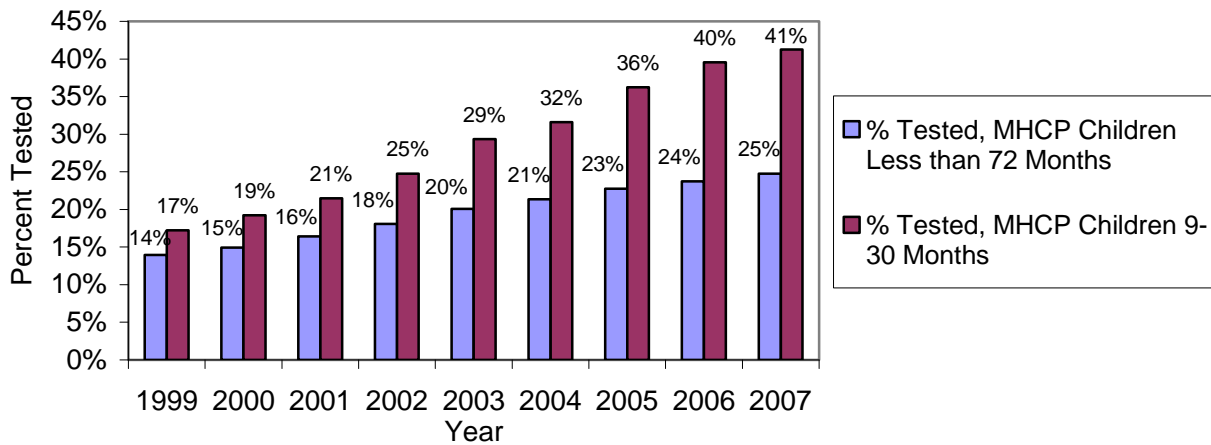
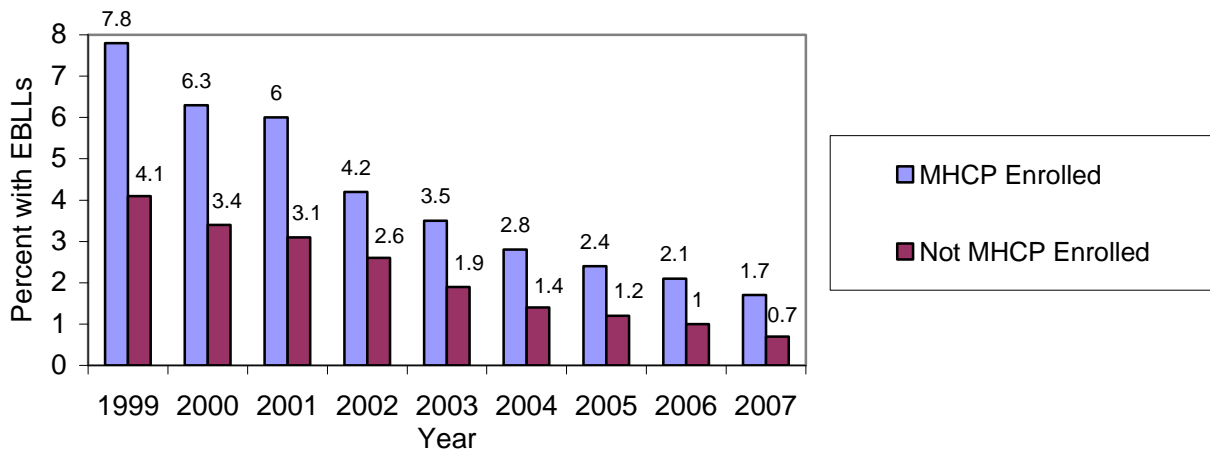


Figure 4. Percentage of Tested Children Less than 72 Months Old with EBLLs



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.

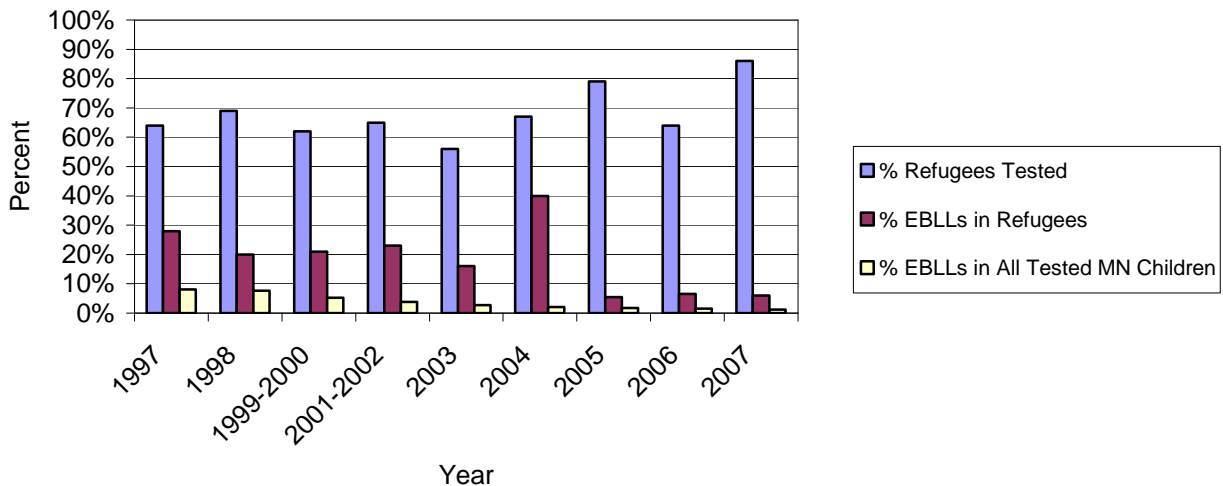
Table 3. Number and Percent of Refugee Children (0-72 Months) Tested and with Elevated Blood Lead Levels in 2007 by Country of Origin

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 EBLs 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 EBLs 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 ($\mu\text{g}/\text{dL}$) 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 EBLs 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 EBLs. 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 M-CLEAN 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 lessors of pre-1978 housing to disclose the presence of known lead hazards, including lead-based paint. Sellers and lessors 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 EBLs, along with testing rates and rates of EBLs 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 EBLs, 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

Not included in this document

Appendix B

2005 Blood Lead Surveillance Report

Not included in this document

Appendix C

Single-Page Summaries of Blood Lead Guidelines

Not include in this document