

2014 Blood Lead Surveillance Report

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Acronyms and Abbreviations

ABLES	Adult Blood Lead Epidemiology and Surveillance Program
BLIS	Blood Lead Information System
CDC	Centers for Disease Control and Prevention
DHS	Minnesota Department of Human Services
EBLL	Elevated blood lead level
LPHHP	MDH Lead Poisoning and Healthy Homes Program
MDH	Minnesota Department of Health
MEDSS	Minnesota Electronic Disease Surveillance System
MHCP	Minnesota Health Care Programs
MN.IT	State of Minnesota Information Technology Services
MNOSHA	Minnesota Occupational Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
RFP	Request for Proposals
µg/dL	Micrograms of lead per deciliter of whole blood

Executive Summary

This 2014 Blood Lead Surveillance Report describes the activities of the Minnesota Department of Health (MDH) Lead Poisoning and Healthy Homes Program (LPHHP) and the data resulting from the MDH Blood Lead Information System (BLIS) for the 2014 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 stakeholders in Minnesota, document activities of the LPHHP, and assist local efforts to address housing-based health threats.

As the number of elevated blood lead cases in Minnesota has continued to steadily decline, the MDH LPHHP has also been incorporating “healthy homes” approaches into routine lead program activities. Applying healthy homes strategies will help use existing lead poisoning prevention resources to address additional housing-based environmental health threats, including asthma, pests, fire safety, radon, carbon monoxide, and mold/moisture. This report contains an overview of steps taken to implement a healthy homes program in Minnesota.

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 use, lead dust accidentally brought home from parents' workplaces and hobby areas, and some imported products and traditional remedies. However, deteriorated lead paint in homes is the main source of lead exposure for U.S. children today. As lead paint deteriorates, it creates fine dust that is identical in appearance to ordinary house dust. Although lead paint was banned for residential use in 1978, many older homes still contain lead paint. It is estimated that nearly one million homes in Minnesota still have lead paint. These homes may be found in both urban and rural areas.

Elevated levels of blood lead occurring during the first years of life may not produce symptoms until the children enter school and display learning difficulties, reduction in IQ, or behavior problems.

Children less than six years old 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 greater risk because lead easily passes through the placenta to the fetus. The changing nutritional needs of the mother also cause release of lead stored in bone. Certain populations are at increased risk of lead poisoning. For example, children enrolled in 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 because 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.

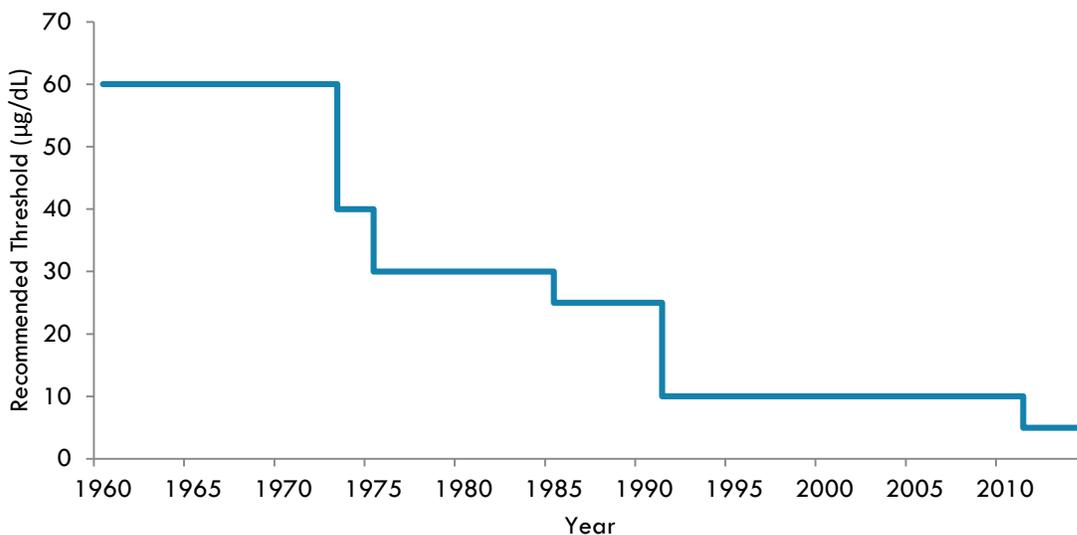
Elevated Blood Lead Levels

The Centers for Disease Control and Prevention (CDC) recently discarded their “level of concern” of 10 micrograms of lead per deciliter whole blood ($\mu\text{g}/\text{dL}$) in favor of a reference value of 5 $\mu\text{g}/\text{dL}$ (**Figure 1**). This value is based on the average blood lead level in the American population. Confirmed blood lead test results above the 5 $\mu\text{g}/\text{dL}$ reference value are now expected to trigger a public health response. CDC also acknowledges that there is no safe level of exposure to lead, and the effects of lead exposure appear to be irreversible. Therefore, primary prevention, or preventing lead poisoning before it can start, is crucial.

In April 2014, Health Commissioner Ed Ehlinger issued a finding that changed the definition of an elevated blood lead level (EBLL) under Minnesota statute 144.9501 Subd. 9 to a diagnostic blood lead test of at least 5 $\mu\text{g}/\text{dL}$. The previous definition of an EBLL had been 10 $\mu\text{g}/\text{dL}$. The commissioner’s finding makes the statute consistent with the existing Minnesota case management guidelines and CDC recommendations.

Minnesota statute 144.9504 mandates environmental interventions for confirmed blood lead levels of 15 $\mu\text{g}/\text{dL}$ or greater in children less than six years old. For levels of 5 $\mu\text{g}/\text{dL}$ 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 primary intervention.

Figure 1. Historic CDC Recommendations for Elevated Blood Lead Level Thresholds

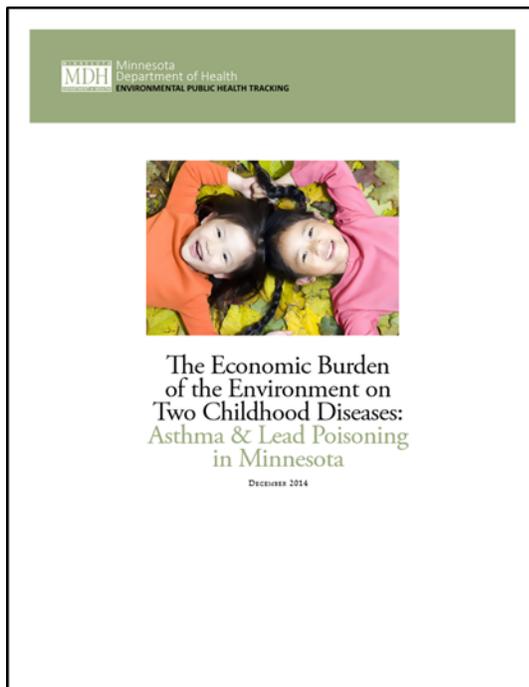


Economic Burden of Lead

The MDH LPHHP, MDH Environmental Public Health Tracking Program, and MDH Asthma Program collaborated to produce a report: “The Economic Burden of the Environment on Two Childhood Diseases: Asthma & Lead Poisoning in Minnesota”. The report was released in December 2014 and revealed that despite decreases over time in the number of children that were exposed to lead, the total economic burden of childhood lead poisoning on lifetime earnings in the 2004 birth cohort in Minnesota is \$1.9 billion as a result of decreased IQ. The costs calculated in this report likely underestimate the true cost to Minnesota’s economy of lead poisoning in children because the report does not capture other long-term medical or behavioral effects of lead exposure and does not include the costs to treat lead poisoning or remediate indoor or outdoor environments that contain excessive levels of lead. In addition, we know that the burden and cost of environmentally attributed disease in Minnesota’s children is not shared equally across all communities of the state. In particular, communities with high percentages of older housing and high rates of poverty are disproportionately affected.

The full report is available online at

<http://www.health.state.mn.us/divs/hpcd/tracking/pubs/BurdenReport.pdf>.



State Blood Lead Guidelines

MDH has a set of four guidelines available for lead: Childhood Blood Lead Screening, Childhood Blood Lead Case Management, Childhood Blood Lead Clinical Treatment, and Blood Lead Screening for Pregnant Women, which may be found at the MDH Web site at www.health.state.mn.us/lead. These guidelines are intended to establish standardized screening practices and minimum levels of care for providing services to children. However, local health departments that have greater resources available may wish to take a more rigorous approach to case management.

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 high rates of elevated blood lead
2. Children matching specific groups that have high rates of elevated blood lead

Universal testing 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 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.

Childhood Blood Lead Case Management Guidelines

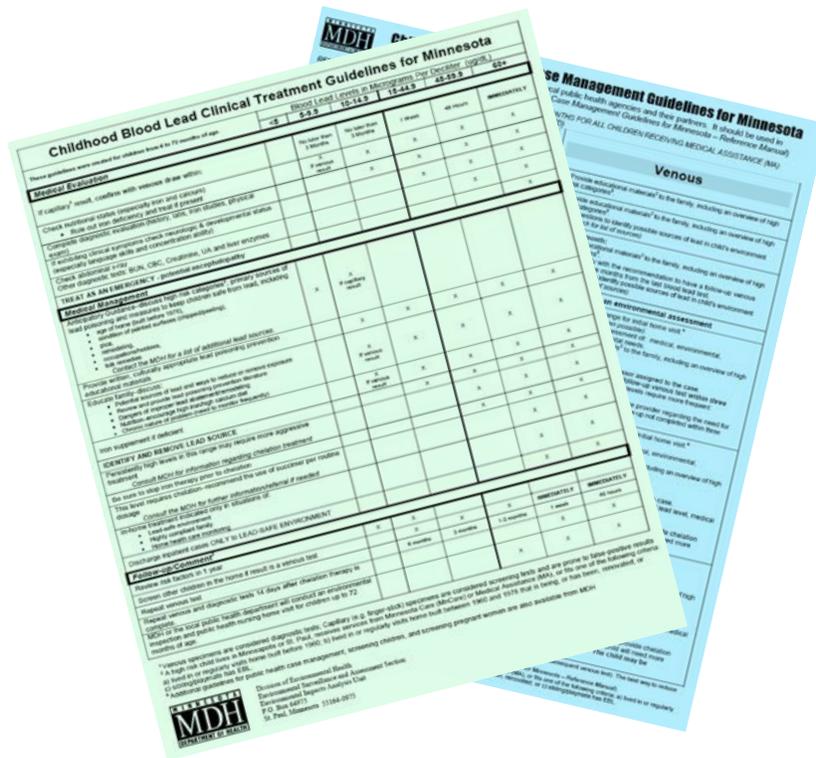
The Case Management Guidelines work in concert with the MDH Blood Lead Screening Guidelines for Minnesota to identify and manage lead exposure in children. A qualified case manager should oversee the treatment and recovery of each child, and ensure that steps are taken to prevent further exposure of the child to potential sources of lead. Appropriate steps are presented for both capillary and venous test results.

Childhood Blood Lead Clinical Treatment Guidelines

The Childhood Blood Lead Clinical Treatment Guidelines are designed to assist physicians in treating patients in Minnesota with elevated blood lead levels, thus ensuring that all cases receive a consistent level of care. Because the CDC and MDH now recognize that there are no safe levels of exposure to lead, the clinical treatment guidelines recommend engaging families through education at blood lead levels of 5–10 µg/dL. Additional diagnostic tests and interventions, such as radiographs, additional bloodwork, and chelation therapy, are recommended for higher blood lead levels.

Blood Lead Screening Guidelines for Pregnant Women

The Blood Lead Screening Guidelines for Pregnant Women in Minnesota are designed to assist healthcare providers in screening pregnant women for elevated blood lead levels. Not every woman is at risk for lead exposure, so a risk screening questionnaire should be used to decide whether testing is recommended. Examples of risk factors for lead exposure include occupational exposure of the mother or another family member, remodeling a home containing lead paint, using non-commercial home remedies that contain lead, and pica behavior of the mother. Identifying and preventing elevated blood lead levels in pregnant women also serves to protect the developing fetus. MDH is updating its guidelines for lead screening and treatment of pregnant and breastfeeding women; updated guidelines will be released in 2015.



Data Collection

Lead Testing

Since not all Minnesota children have a high risk for lead exposure, targeted testing based on established risk factors is recommended for most areas of the state. Children should be evaluated using a screening questionnaire to determine whether they have risk factors for lead exposure; the goal is to test all children who are at risk for exposure to lead. Because lead testing is neither universal nor randomly sampled, the data in this report are not generalizable and cannot be used to interpret the prevalence or incidence for the overall population of children living in Minnesota.

The blood specimens used in blood lead testing are drawn from either capillaries or veins (venous specimens). Tests on capillary blood are considered “screening” tests. They are drawn from a finger stick, allowing them to be performed in a wide range of settings. However, a 2008 MDH study requested by the Legislature showed that 68% of initial elevated capillary results reported to MDH were false positives. Venous specimens are drawn from a vein and are considered “diagnostic” because they are less prone to false positives than capillary tests. However, they can be more difficult to obtain. Venous tests are required to initiate an environmental investigation of an elevated lead result.

The MN Blood Lead Information System (BLIS)

MDH maintains a blood lead information system (BLIS) for tracking and monitoring trends in blood lead levels in adults and children in Minnesota. Analytical laboratories submit results to the LPHHP, as mandated by Minnesota Statute 144.9502. 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. Data are also used to plan, develop, and implement primary prevention programs.

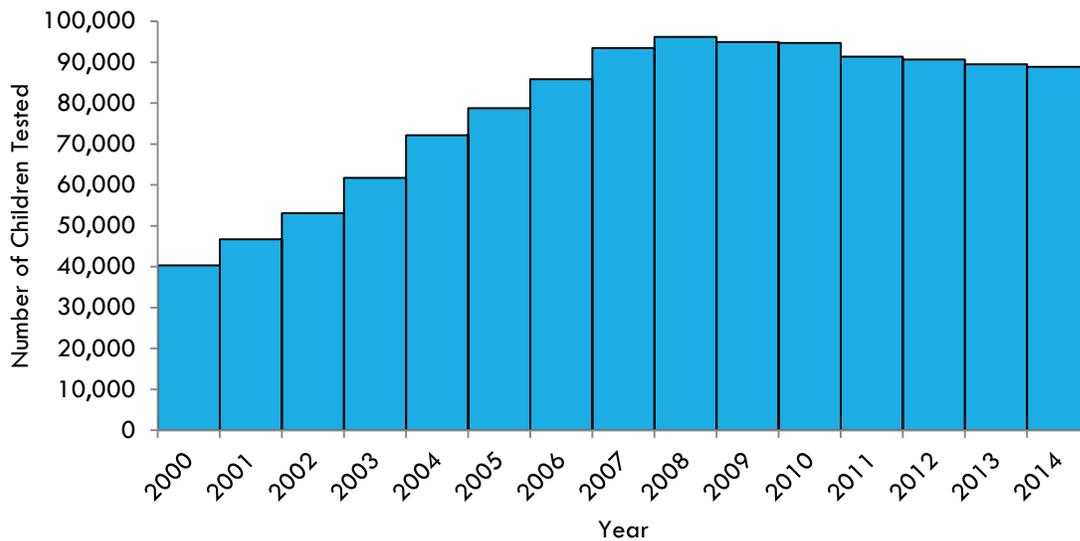
Statewide Surveillance Data

Statewide data are available starting from 1995. Data for years 2000–2013 are shown for comparison to the 2014 data. In 1995, fewer than 40,000 children were tested for lead and more than 900 (3%) children had venous blood lead levels of at least 15 $\mu\text{g}/\text{dL}$.

The number of children tested for lead in Minnesota increased from 2000 through 2008, then began to decrease during 2009–2014. In 2014, 88,842 children were tested (**Figure 2**).

The decrease in the number of children tested for lead might be partially attributable to the loss of Medicaid withholds. Since 2013, Medicaid no longer withholds a portion of the reimbursement to clinics for well child visits unless a blood lead test is conducted. This has decreased the incentive for healthcare providers to ensure that all children receiving medical assistance are screened for lead at one and two years of age.

Figure 2. Number of Children Tested Less than 6 Years of Age



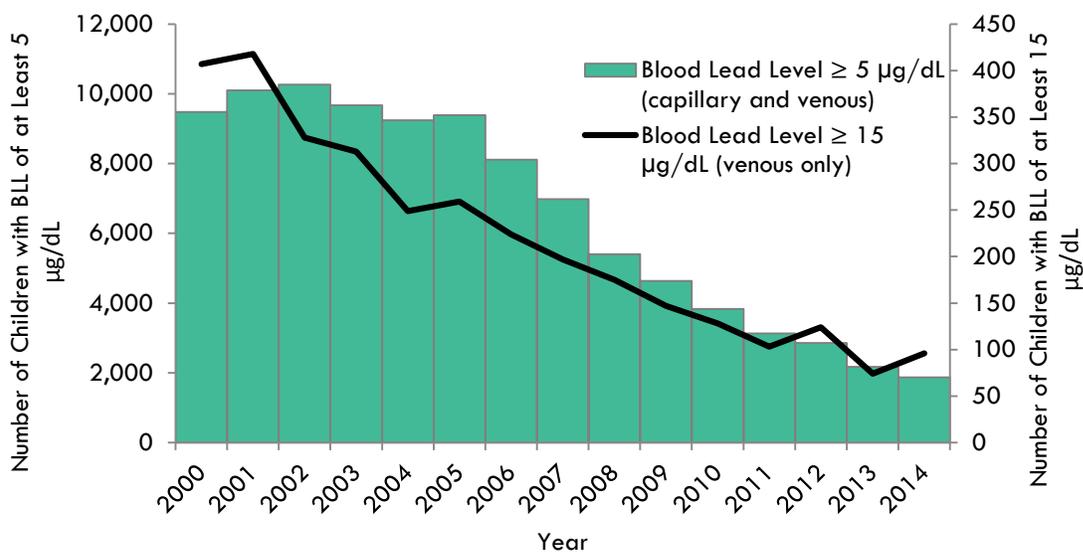
Elevated Blood Lead Levels in Children

The trends in the number of EBLL cases in Minnesota children may be compared across years (**Figure 3**). Thanks to ongoing prevention efforts, the number of EBLL cases has continued to decrease. However, in 2014, there were still 96 Minnesota children who had venous blood lead levels of at least 15 $\mu\text{g}/\text{dL}$. The highest venous blood lead level identified in a child from Minnesota in 2014 was 72 $\mu\text{g}/\text{dL}$.

In 2014, there were 2,643 venous and capillary test results from 1,867 children of at least 5 $\mu\text{g}/\text{dL}$. Guidelines recommending using 5 $\mu\text{g}/\text{dL}$ as the threshold for public health action were adopted in Minnesota in 2011 and the statutory definition of an elevated blood lead level was changed to 5 $\mu\text{g}/\text{dL}$ in 2014. Data for years 2000–2013 are shown for comparison.

Children with blood lead levels at or above 5 $\mu\text{g}/\text{dL}$ should receive follow-up testing and educational materials, according to the Minnesota case management guidelines. Higher levels may require additional public health actions such as more intensive case management to ensure the family has access to resources and environmental risk assessments to determine the source of the lead exposure. Rates of follow-up testing are described below. After attempts at follow-up testing were made, 1,288 children in 2014 still had blood lead levels of at least 5 $\mu\text{g}/\text{dL}$.

Figure 3. Number of Children with Blood Lead Levels (BLL) of at Least 5 $\mu\text{g}/\text{dL}$ and 15 $\mu\text{g}/\text{dL}$



Blood Lead Testing by County

County-specific data on blood lead testing and blood lead levels are provided at the end of this report in **Appendix A**.

Case Management

The LPHHP provides technical assistance to local public health agencies in the state of Minnesota through the State Case Monitor. Assistance is provided to ensure case management services are available for children with blood lead levels of at least 5 µg/dL. These activities include:

- Assuring case management activities and follow-up testing for children and pregnant women are performed in accordance with MDH guidelines;
- Providing educational materials, in appropriate languages, to assist in communicating lead exposure prevention measures;
- 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.

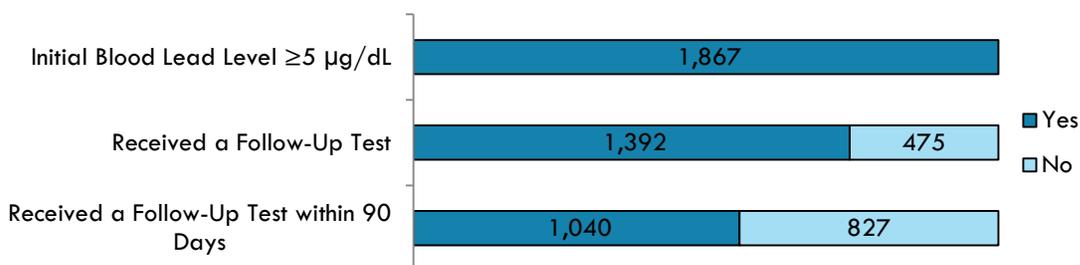
Case monitoring activities have helped clinicians improve their adherence to Minnesota blood lead guidelines and have provided increased collaboration between public health and housing staff at both the state and local level.

Follow-up Testing

MDH recommends follow-up tests for children with elevated blood lead levels. The period of time recommended for re-testing varies according to the initial blood level, but the maximum time is 90 days for any child with a blood lead level of 5 µg/dL or greater. Of the 1,867 Minnesota children identified with a blood lead level of 5 µg/dL or greater in 2014, 1,392 (75%) received a follow-up test (**Figure 4**). Of these, 1,040 (56% of the children with blood lead levels of 5 µg/dL or greater) were retested within 90 days of their initial test.

Follow-up testing has been recommended for blood lead tests of at least 5 µg/dL since 2011. Fewer follow-up tests were conducted in 2011 because the change in the guidelines occurred mid-year. However, during 2012–2014, follow-up rates steadily increased. Further increasing the follow-up rate and reducing the time between tests will require the combined efforts of providers, case managers, families, and the MDH Lead Program.

Figure 4. Follow-up Testing for Children Aged Less Than 6 Years with Blood Lead Levels of at Least 5 µg/dL



Special Populations

Medicaid 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. National studies have shown that Medicaid-enrolled children are three times more likely to have elevated blood lead levels than non-enrolled children. These data were supported by a joint study between the MDH Lead Program and Minnesota Department of Human Services (DHS) released in 2002. Children enrolled in Minnesota Health Care Programs (MHCP) were nearly twice as likely as non-MHCP children to have EBLLs (9.8% compared to 5%). However, despite their high-risk status, less than a third of MHCP-enrolled children are tested by the time they reach 72 months.

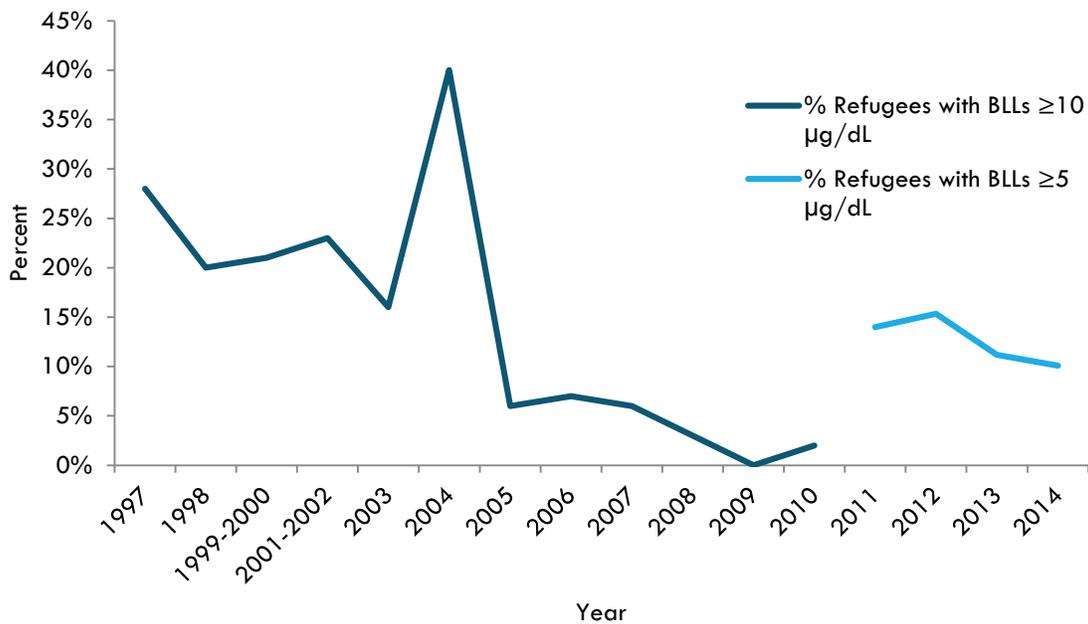
The Minnesota DHS no longer provides monetary incentives to health plans to encourage blood lead testing. However, to help assess blood lead testing rates, MDH routinely matches BLIS data with information from DHS (using a data sharing agreement to ensure data privacy) and reports on test results received. The matched data are important to ensure that reporting to federal agencies on mandatory testing is as accurate as possible.

Refugee Children

Refugees are persons who are forced to leave their home country because of disasters, war, or persecution. Refugees come to Minnesota with a special immigration status and are a population at high risk for lead poisoning. Refugees may have lead exposure in their country of origin, and once they are in the U.S., frequently move into older housing with potential for further exposure to lead-based paint. The Division of Infectious Disease Epidemiology, Prevention, and Control at MDH collects demographic data on refugee children aged less than 17 years entering the state who receive an initial health screening.

Blood lead tests were matched to refugee information (**Figure 5**). During 2014, most elevated blood lead levels (at least 5 µg/dL) among refugee children occurred in individuals who originated in East Africa, Southeast Asia, and the Middle East. Elevated blood lead levels were also identified among refugee children from South Asia, Central Africa, and Eastern Europe. The rate of elevated blood lead levels for refugees has been declining, although it is nearly five times as high as the percentage of elevated blood lead levels among all Minnesota children.

Figure 5. Elevated Blood Lead Levels (BLLs) among Refugee Children Less than 17 Years of Age Who Received a Blood Lead Test



Adults

The National Institute for Occupational Safety and Health (NIOSH) has designated 10 µg/dL of whole blood as the reference blood lead level for adults, while the Minnesota Occupational Safety and Health Administration (MNOSHA) requires action in exposed workers at a level of 40 µg/dL. In Minnesota, a blood lead level of 5 µg/dL or higher is considered elevated and public health action is recommended when EBLs occur in pregnant women. Minnesota's Adult Blood Lead Epidemiology and Surveillance (ABLES) program began identifying adults with EBLs in 1998.

The total number of tests reported in 2014 for adults in Minnesota is presented in **Table 1**. There were 558 adults with blood lead levels of 10 to 39 µg/dL, and 4 adults with reported levels of 40 µg/dL or greater. Although pregnancy status is not a routine part of data collection, the LPHHP follows up on cases when notified that a patient with a blood lead level of 5 µg/dL or higher is pregnant. Providers are urged to include a lead risk assessment questionnaire as a routine part of exams for pregnant women.

Federal funding for ABLES was discontinued during 2013. State resources allowed test results for adults to continue to be entered into BLIS, but the ability of the LPHHP to gather additional information on employers and occupations was essentially eliminated.

TABLE 1. MINNESOTA RESIDENTS 16 YEARS OR OLDER WITH A REPORTED BLOOD LEAD LEVEL (BLL)

	2014
Number of Reports	8,887
Number of Individuals Tested	7,578
Individuals with BLL of 5–9 µg/dL	391
Individuals with BLL of 10–39 µg/dL	558
Individuals with BLL of ≥40 µg/dL	4
Range of Reported Results	0.0–50.0 µg/dL

Evaluation of BLIS

The use of electronic reporting formats allows for greater efficiency in handling large numbers of records. The LPHHP works with the Minnesota Electronic Disease Surveillance System (MEDSS) to incorporate electronic reporting of blood lead test results into routine data handling by MDH.

In 2014, there were 106,872 total blood lead tests reported to BLIS, 75% of which were received electronically (**Table 2**), which significantly improves timeliness and requires less staff time for entry of records into BLIS. The majority of tests received were capillary tests. Tests were received from 83 separate laboratories during 2014.

Extensive efforts are made by MDH staff to ensure the completeness of data in BLIS. During 2014, both city and zip code were missing from entered data only 1.5% of the time, (down from 9% in 2006). The patient's date of birth was available for all but one record; the patient with a missing date of birth is known to be an adult.

TABLE 2. NUMBER AND TYPE OF BLOOD LEAD TEST RESULTS REPORTED TO BLIS

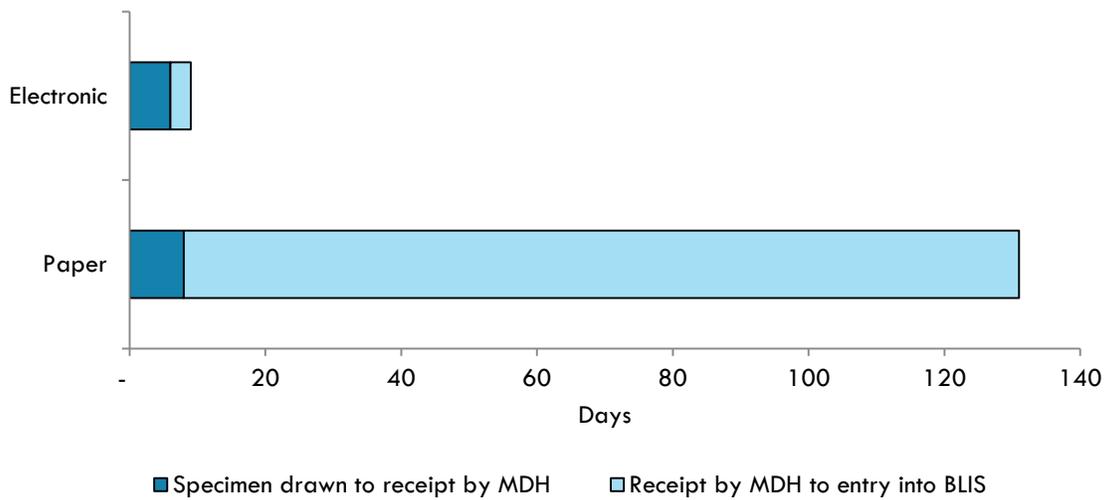
	2014	
	No.	(%)
Blood Lead Tests Reported	106,872	--
Paper Reporting (<i>Mail or Fax</i>)	26,305	(25)
Electronic Reporting (<i>Encrypted Email or Secure Web Downloads</i>)	80,567	(75)
Blood Test Type		
Capillary	77,623	(72)
Venous	27,424	(26)
Unknown Test Type	1,825	(2)

The median total time from specimen collection to entry into BLIS was 9 days for electronic records during 2014 (**Figure 6**). The loss of CDC funding in 2011 led to a reduction in LPHHP staffing, causing an increase in the median time between specimen date and entry date for paper records from 35 days in 2011 to 166 days in 2013. State funding was made available to recover some of this capacity, so the median time required to enter records received by paper decreased to 131 days in 2014. This delay applies to blood lead test results below 5 µg/dL; results at or above 5 µg/dL are separated and entered immediately upon receipt. Gains in the speed of paper record entry were slowed because of a large laboratory whose lead tests had previously been sent to an outside laboratory that reported electronically. In 2014, the

laboratory purchased its own equipment for analyzing blood lead tests and began reporting results on paper, causing a 42% increase in the number of records that had to be manually entered by MDH from 2013 to 2014. LPHHP and MN.IT staff have been working with the laboratory to establish an electronic reporting system.

Support of the state’s capacity to enter all records in a timely manner remains critical to addressing the needs of children who have been exposed to lead. In addition, the infrastructure for electronic laboratory reporting is critical to ensuring a timely public health surveillance system.

Figure 6. Median Timeframes for Electronic and Paper Blood Lead Test Results Reported to BLIS, 2014



Other Resources Available from LPHHP

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/lead). This site contains information on hot topics (including current data, projects and requirements), numerous fact sheets, a list of “frequently asked questions”, all publications and reports (including guidelines for screening children and pregnant women, case management, and clinical treatment in children), and links to many external lead resources.

M-CLEAN

The Minnesota Collaborative Lead Education and Assessment Network (M-CLEAN) is a workgroup that discusses lead poisoning prevention initiatives and legislative developments. Membership is open to all interested stakeholders. Organizations that typically participate in M-CLEAN include MDH, local public health agencies, other governmental agencies, community action agencies, non-profit organizations, and industry groups. M-CLEAN meetings restarted in 2015 following a hiatus during the period when CDC was not funding lead poisoning prevention programs. More information on M-CLEAN meetings can be found at <http://www.health.state.mn.us/divs/eh/lead/mclean/index.html>.

Swab Team Services Grants

MDH has collaborated with community partners through Swab Team Services Grants since 2006. The grants are authorized under Minnesota Statute 144.9512.

MDH’s Swab Team Services Grant provides nonprofit organizations with funding to:

- Increase the screening of children under six years and pregnant women to identify elevated blood lead levels (EBLL) in populations at high risk for lead exposure
- Plan, implement, and execute successful lead screening events in communities with high lead exposure
- Provide education and outreach services when an EBLL is identified
- Provide swab team services to protect populations from identified lead hazards in their residences

Organizations funded by the Swab Team Services Grants during 2014 were Sustainable Resources Center, CLEARCorps USA, and Frogtown Neighborhood Association.

Further Lead Information

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

Transition to Healthy Homes

Minnesota data compiled by MDH show that these housing-based hazards can have a significant impact on health and wellness:

- One in three Minnesota homes has high levels of radon and there is no area of the state that has a “low” radon exposure potential. Radon exposure increases the risk for lung cancer of Minnesota residents.
- Over 100,000 unintentional falls statewide were reported to the Minnesota Injury Data Access System in 2013; CDC estimates that about half of falls reported each year occur in the home.
- There were over 19,000 emergency department visits for asthma in 2013; over 7,000 of those visits were among children aged less than 15 years.
- From 2009 through 2013, 60 Minnesotans died from unintentional exposure to carbon monoxide. The majority of these deaths occurred in the home.

Healthy Homes Grants

In 2014, the Minnesota Legislature passed 144.9513, which defined healthy housing and established healthy housing grants. In July 2014 MDH issued a Request for Proposals (RFP) from local boards of health, community action agencies, and nonprofit organizations to participate in implementation grant agreements for healthy homes. The housing-based health threats to be addressed through these grants include:

- Lead
- Asthma
- Radon
- Injuries
- Smoking
- Excessive moisture/mold
- Pests
- Carbon monoxide
- Fire hazards
- Private wells

The scope of work in the RFP had a number of specific focus areas from which the grantees could choose, including:

1. Primary Prevention
2. Training and Technical Assistance
3. Developing Evidence-Based Best Practices
4. Community Engagement and Education
5. Healthy Home Assessments and Interventions
6. Coordination with Healthcare/Secondary Prevention

A total of 14 applications were received for the eight available grants. Each grant agreement will last for three years, contingent on continued appropriations. Awards were divided into two funding levels. The larger awards are for \$40,000 annually and the smaller awards are for \$20,000 annually. One of the smaller awards is designated for mini grants. The organization administering the mini grant awards will administer five grants per year of approximately \$2,000 each. The goal of the mini grants is to promote health equity by funding smaller organizations that would not have the capacity to apply for larger state grants. Successful applicants were distributed through metro and non-metro areas of the state, and are listed below and shown in the map (**Figure 7**).

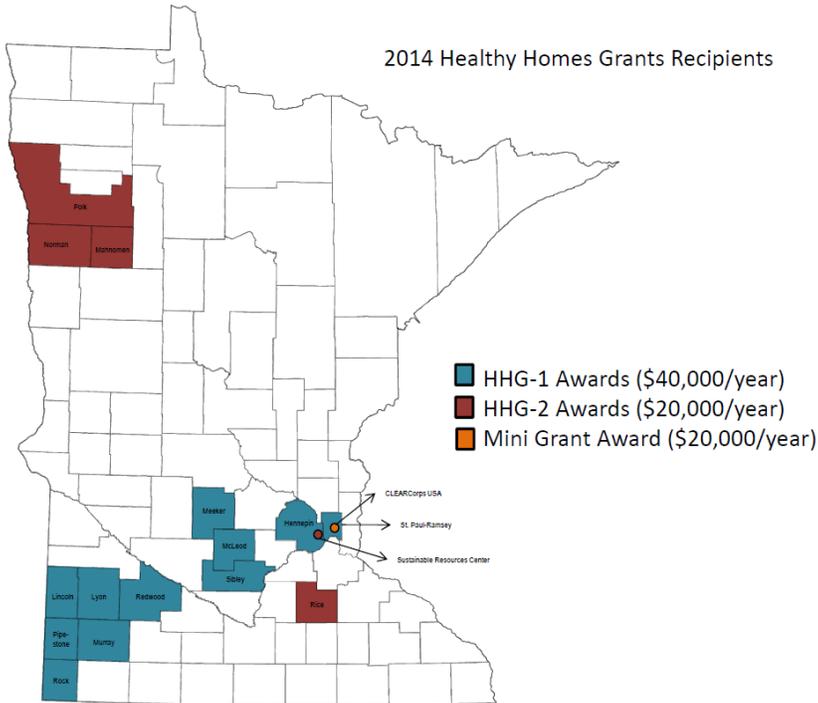
Awards of \$40,000 Per Year:

- Hennepin County
- Meeker-McLeod-Sibley Community Health Services
- Southwest Health and Human Services
- St. Paul-Ramsey County Public Health

Awards of \$20,000 Per Year:

- Polk-Norman-Mahnomen Community Health Board
- Rice County Community Health Services
- Sustainable Resources Center
- CLEARCorps USA (Mini Grant Award Administration)

Figure 7. Grant Recipients for the 2014 Healthy Homes Grants



Revised 9/23/2014

Appendix A: Blood Lead Testing by County

County	5–14.9 µg/dL*		15 µg/dL or greater*		Total Children Tested Under 6 Years		
	Venous	Capillary	Venous	Capillary	Any Test Type	Population (2013) [†]	Percent Tested
Aitkin	0	3	0	0	151	796	19%
Anoka	17	21	2	1	6,123	26,149	23%
Becker	1	5	0	0	569	2,534	22%
Beltrami	1	7	0	0	674	4,240	16%
Benton	0	3	0	0	954	3,243	29%
Big Stone	0	5	0	0	82	351	23%
Blue Earth	7	6	1	0	884	4,554	19%
Brown	2	3	1	0	414	1,779	23%
Carlton	1	0	0	0	598	2,535	24%
Carver	4	5	1	0	1,052	7,564	14%
Cass	1	3	1	0	463	1,965	24%
Chippewa	1	1	1	0	252	878	29%
Chisago	1	4	0	1	611	3,589	17%
Clay	2	5	0	0	997	4,865	20%
Clearwater	0	0	0	0	75	708	11%
Cook	1	1	0	0	39	285	14%
Cottonwood	1	0	2	0	101	874	12%
Crow Wing	3	4	0	0	926	4,632	20%
Dakota	20	21	2	1	6,839	32,485	21%
Dodge	2	6	0	0	220	1,672	13%
Douglas	1	5	1	0	482	2,429	20%
Faribault	6	4	2	0	184	948	19%
Fillmore	2	2	0	0	177	1,635	11%
Freeborn	15	2	1	0	453	2,165	21%
Goodhue	8	1	2	0	534	3,443	16%
Grant	1	1	0	0	100	424	24%
Hennepin	203	137	26	5	21,065	94,109	22%
Houston	1	7	0	0	218	1,151	19%
Hubbard	1	3	0	0	209	1,436	15%
Isanti	1	0	0	0	589	2,977	20%

2014 BLOOD LEAD SURVEILLANCE REPORT

County	5–14.9 µg/dL*		15 µg/dL or greater*		Total Children Tested Under 6 Years		
	Venous	Capillary	Venous	Capillary	Any Test Type	Population (2013) [†]	Percent Tested
Itasca	1	2	0	0	770	3,004	26%
Jackson	1	2	0	0	120	716	17%
Kanabec	1	3	0	0	218	984	22%
Kandiyohi	9	6	4	0	793	3,341	24%
Kittson	0	2	0	1	24	274	9%
Koochiching	0	1	0	0	169	751	23%
Lac Qui Parle	3	1	1	0	90	461	20%
Lake	0	1	0	0	158	676	23%
Lake of the Woods	0	0	0	0	29	226	13%
Le Sueur	3	2	0	0	328	2,112	16%
Lincoln	3	1	2	0	77	428	18%
Lyon	2	4	0	1	637	2,222	29%
McLeod	2	2	0	0	509	2,622	19%
Mahnomen	0	0	0	0	103	691	15%
Marshall	0	0	0	0	75	674	11%
Martin	5	2	0	0	286	1,346	21%
Meeker	2	2	0	0	337	1,807	19%
Mille Lacs	1	3	0	0	412	1,958	21%
Morrison	1	3	0	0	613	2,538	24%
Mower	13	5	4	0	513	3,331	15%
Murray	0	0	1	0	115	579	20%
Nicollet	1	1	0	0	471	2,446	19%
Nobles	3	2	1	0	535	2,050	26%
Norman	1	0	0	0	74	400	19%
Olmsted	7	8	2	0	1,194	12,986	9%
Otter Tail	6	6	0	0	568	3,968	14%
Pennington	1	0	0	0	125	1,148	11%
Pine	1	1	0	0	344	1,855	19%
Pipestone	0	2	1	0	158	718	22%
Polk	1	6	0	0	427	2,418	18%
Pope	1	1	0	0	152	761	20%
Ramsey	141	123	20	2	11,708	44,211	26%
Red Lake	0	0	0	0	39	319	12%
Redwood	3	3	1	0	269	1,209	22%

2014 BLOOD LEAD SURVEILLANCE REPORT

County	5–14.9 µg/dL*		15 µg/dL or greater*		Any Test Type	Population (2013) [†]
	Venous	Capillary	Venous	Capillary		
Renville	3	1	0	0	292	1,070
Rice	14	15	1	0	1,217	4,555
Rock	0	2	0	0	130	707
Roseau	2	3	0	0	127	1,145
St. Louis	11	22	9	0	3,054	12,555
Scott	4	2	0	0	2,229	12,417
Sherburne	5	6	0	0	1,552	7,532
Sibley	1	4	1	0	227	1,129
Stearns	7	12	0	0	2,967	11,408
Steele	2	7	1	0	631	3,024
Stevens	1	1	1	0	141	653
Swift	1	2	0	0	146	691
Todd	1	0	0	0	388	1,957
Traverse	2	1	0	0	34	226
Wabasha	3	0	1	0	238	1,546
Wadena	0	5	0	0	299	1,091
Waseca	1	2	1	0	311	1,374
Washington	13	14	0	1	3,142	18,554
Watsonwan	2	5	0	0	192	883
Wilkin	0	0	0	0	71	476
Winona	7	0	1	0	446	2,840
Wright	8	9	0	0	2,002	11,920
Yellow Medicine	1	0	0	0	173	747
Unknown	0	0	0	0	358	N/A
Total	606	573	96	13	88,842	420,145

*When multiple results were available, the highest venous result was used to categorize the individual. If no venous results were available, the highest capillary result was used.

[†]Population data obtained from: US DHHS, CDC, NCHS, United States July 1st resident population by state, county, age, sex, bridged-race, and Hispanic origin. Compiled from bridged-race Vintage 2013 (2010-2013) postcensal population estimates. Accessed at CDC WONDER On-line Database: <http://wonder.cdc.gov/bridged-race-v2013.html> on Jun 2, 2015.