

# Lead Poisoning Prevention Programs Biennial Report

MINNESOTA DEPARTMENT OF HEALTH  
REPORT TO THE MINNESOTA LEGISLATURE 2017



HEALTH RISK INTERVENTION UNIT AND ASBESTOS AND LEAD COMPLIANCE UNIT

## **2017 Lead Poisoning Prevention Programs Biennial Report**

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# Acronyms and Abbreviations

ABLES	Adult Blood Lead Epidemiology and Surveillance
ALC	MDH Asbestos and Lead Compliance Unit
BLIS	Blood Lead Information System
CDC	US Centers for Disease Control and Prevention
DHS	Minnesota Department of Human Services
EBLL	Elevated blood lead level; 5 µg/dL under current Minnesota statutes
EPA	US Environmental Protection Agency
ESA	MDH Environmental Surveillance and Assessment Section
FY	Fiscal Year
HUD	US Department of Housing and Urban Development
LHHP	Lead and Healthy Homes Program
LHR	Lead hazard reduction
M-CLEAN	Minnesota Collaborative Lead Education and Assessment Network
MDH	Minnesota Department of Health
MHCP	Minnesota Health Care Plans
MN	Minnesota
MS	Minnesota Statutes
NIOSH	National Institutes of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PRE	Pre-Renovation Education
RFP	Request for Proposals
RRP	Renovation, Repair, and Painting
µg/dL	Micrograms of lead per deciliter of whole blood

# Executive Summary

The State of Minnesota has consistently played a leading role in identifying and addressing public health issues related to lead exposure. This report documents activities conducted by the Minnesota Department of Health (MDH) between January 2015 and January 2017.

Scientific evidence continues to demonstrate toxic effects of lead at low levels; recent literature shows there is no safe level of exposure to lead. This prompted the Commissioner of Health to lower the threshold for an elevated blood lead level (EBLL) in April 2014 which led to changes within the MDH guidelines for screening, case management, and clinical treatment of lead poisoning.

MDH continued to collect information on all lead tests performed on Minnesota residents through the Blood Lead Information System (BLIS). During 2015 and 2016 the number of blood lead tests performed remained at a high level. The number of EBLL cases continued to decrease, which is consistent with national trends.<sup>1</sup> When children with EBLLs are identified, MDH provides case management support to local public health agencies.

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.

Although reported EBLLs are declining nationally<sup>1</sup> 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.

In addition to lead poisoning, the lead program addresses general healthy housing issues in Minnesota, focusing on housing conditions related to lead exposure as well as other health threats. The 2014 Minnesota Legislature passed Minnesota Statutes, section 144.9513, which established Healthy Housing Grants. These grants were first awarded in October 2014 on a three-year cycle and will be awarded again in 2017.

Future activities will focus on maintaining current program capacity and assuring effective use of available funds. These activities will include continuing:

- Examination of trends in lead poisoning in Minnesota children.
- Outreach and education to 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.
- Implementation of healthy homes grants and expand capacity for addressing housing-based health threats.

- Work with external partners to promote awareness of lead and ensure appropriate delivery of services to at-risk children.
- Efforts to maintain the high quality of data in the BLIS.
- Evaluation of compliance monitoring and enforcement efforts to ensure that a properly trained and skilled lead workforce exists in Minnesota.
- Compliance assistance and outreach to the public and the regulated community.
- Work with the Drinking Water Protection program and the Department of Education on improving testing and response to lead in drinking water in homes and schools.

## Introduction

This biennial report addressing state lead poisoning prevention activities is required by Minnesota Statutes, section 144.9509, subdivision 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.*

Due to the time lag involved in collecting, analyzing, and reporting data, numbers are presented through the end of 2015.

Controlling exposures to lead is critical to protecting the health of all Minnesotans. Exposure to lead can cause learning difficulties, reduction in IQ, and behavior problems in children. Lead exposure has also been associated with infertility, miscarriages, and increased risk of stroke, heart disease, and kidney disease in adults. Children under the age of six and pregnant women are most at risk for harmful impacts of lead. Deteriorated lead paint in homes remains the primary source of lead exposure, but many other sources of lead have been found, such as contaminated soil and water, some imported products and traditional remedies, and occupational sources.

# Elevated Blood Lead Levels

The Centers for Disease Control and Prevention (CDC) current reference level for an elevated blood lead level is 5 micrograms of lead per deciliter of whole blood ( $\mu\text{g}/\text{dL}$ ). This value is based on the 97.5<sup>th</sup> percentile of the blood lead distribution among U.S. children and is expected to be lowered as average blood lead levels continue to decline. Confirmed blood lead test results above the 5  $\mu\text{g}/\text{dL}$  reference value are expected to trigger a public health response. The 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 to eliminating lead exposure. However, secondary prevention, or preventing ongoing exposure among children identified as having elevated blood lead levels, is also necessary to control the detrimental effects of lead exposure.

Minnesota Statutes, section 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 and authorizes environmental interventions for levels between 5 and 14  $\mu\text{g}/\text{dL}$  as resources permit. For levels of 5  $\mu\text{g}/\text{dL}$  or greater, existing state case management guidelines recommend that local public health nurses work with families to decrease lead levels. For most children and adults with lead poisoning, identification and elimination of the source of lead is the main treatment.

## Current State Lead Programs

Lead poisoning prevention activities at MDH continue to be housed within the Division of Environmental Health. The Health Risk Intervention Unit, in the Environmental Surveillance and Assessment (ESA) Section, is responsible for lead-related surveillance activities and case management. The Asbestos & Lead Compliance (ALC) Unit, in the Indoor Environments and Radiation Section, is responsible for assuring compliance with state rules and statutes dealing with identification and management of lead hazards in target housing and child-occupied facilities (affected properties). Other state agencies dealing with lead or blood lead testing include the Pollution Control Agency, Department of Agriculture, Department of Labor and Industry, Department of Natural Resources, Housing Finance Agency, Department of Human Services, Department of Employment and Economic Development, and local housing rehabilitation programs across Minnesota. MDH, the City of Minneapolis, and St. Paul/Ramsey County have duties with respect to environmental case management.

The ESA section manages the federally funded CDC Childhood Lead Poisoning Prevention Program as well as the state-funded Swab Team Services Grants and Healthy Homes Grants. The ESA section also manages the Adult Blood Lead Epidemiology and Surveillance (ABLES) Program through the CDC National Institutes of Occupational Safety and Health (NIOSH).

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 local public 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.

Funding from both state and federal sources allows MDH to operate the statewide database (which is used to evaluate programs, assess population trends, and target limited resources to areas of highest need), maintain guidelines for screening, case management and clinical treatment, provide funding to local agencies for healthy homes assessments, and conduct strategic planning with an array of collaborative partners from government, health care, private industry, and non-profit organizations. Additional funding is provided by the U.S. Environmental Protection Agency (EPA) in the form of a Lead Cooperative Agreement and Enforcement Grant (EPA Grant) and program fees related to accreditation. The EPA Grant supports the ALC Unit with regulatory activities that include licensing individuals, certifying firms, permitting lead training courses, administering independent lead examinations, compliance assistance and enforcing current Minnesota lead regulations with regard to lead hazard reduction and lead hazard evaluation activities.

## Surveillance Activities

MDH maintains a secure 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 Statutes, section 144.9502. The results are entered either manually or electronically into the BLIS database.

As of January 2017, the blood lead database contained over 1.9 million records of blood lead test results from 1.2 million individual Minnesota residents dating back to 1993.

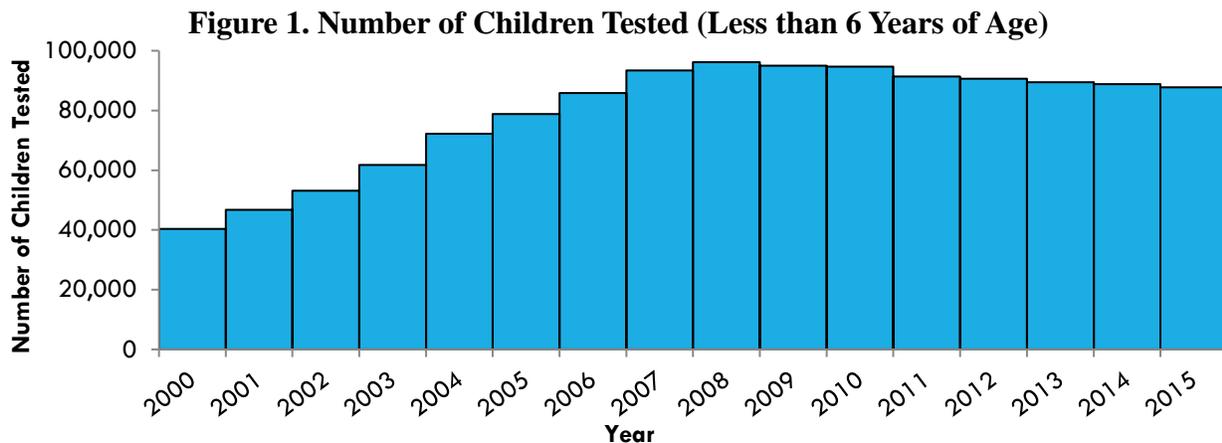
Since not all Minnesota children have a high risk for lead exposure, targeted screening based on established risk factors is currently recommended for most areas of the state. However, because testing is not universal, the tests reported to BLIS are not representative of the entire population of Minnesota. 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.

Presented below are 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 2015 Surveillance Report (**Appendix A**).

## Elevated Blood Lead Levels (EBLLs) in Minnesota

### Blood Lead Levels in Children

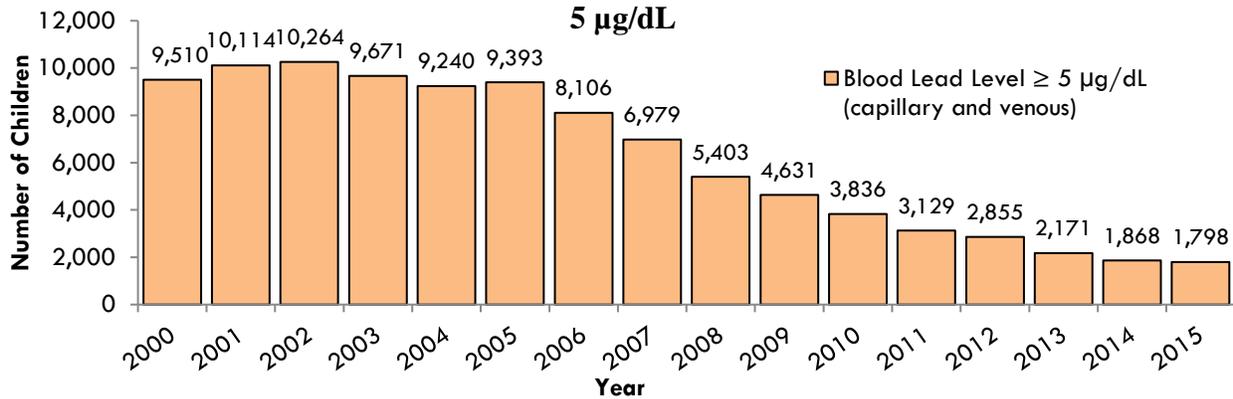
The number of children tested for lead in Minnesota increased from 2000 through 2008, then peaked and began to decrease during 2009–2015. Over 87,000 children were tested in 2015 (**Figure 1**). Since not all Minnesota children are at risk for having elevated blood lead levels, targeted, rather than universal testing is currently recommended for most areas of the state. Therefore, the optimal level of testing will be less than 100 percent. The goal is to test all children at risk for exposure to lead. Among children born in 2012, around 80 percent were tested at least once prior to 3 years of age.



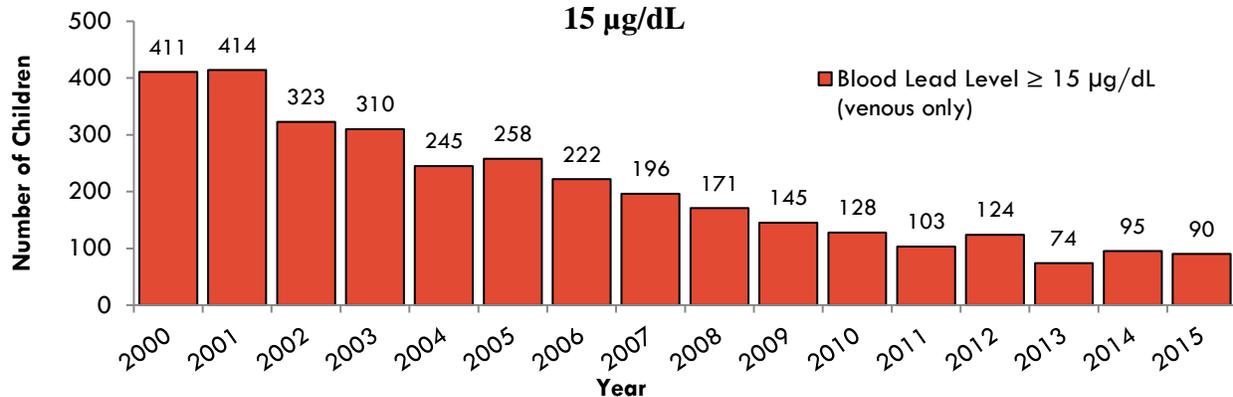
Trends in the number of EBLL cases (e.g., tests greater than or equal to 5  $\mu\text{g}/\text{dL}$ ) in Minnesota children may be compared across years (**Figures 2A-B**). The general downward trend shown in Figures 2A-B is consistent with national trends.<sup>1</sup> Numbers are also shown for venous blood lead levels greater than or equal to 15  $\mu\text{g}/\text{dL}$ , the level at which an environmental assessment is required to identify and mitigate lead exposure.

While the rate of lead testing has remained high in the past decade, the number of EBLL cases has steadily declined. Although these data are difficult to interpret due to many confounding factors, the downward trend for EBLLs suggests that the amount of lead exposure is declining in Minnesota.

**Figure 2a. Number of Children with Blood Lead Levels of at Least 5 µg/dL**



**Figure 2b. Number of Children with Blood Lead Levels of at Least 15 µg/dL**



**Rate of follow-up testing for children with EBLLs**

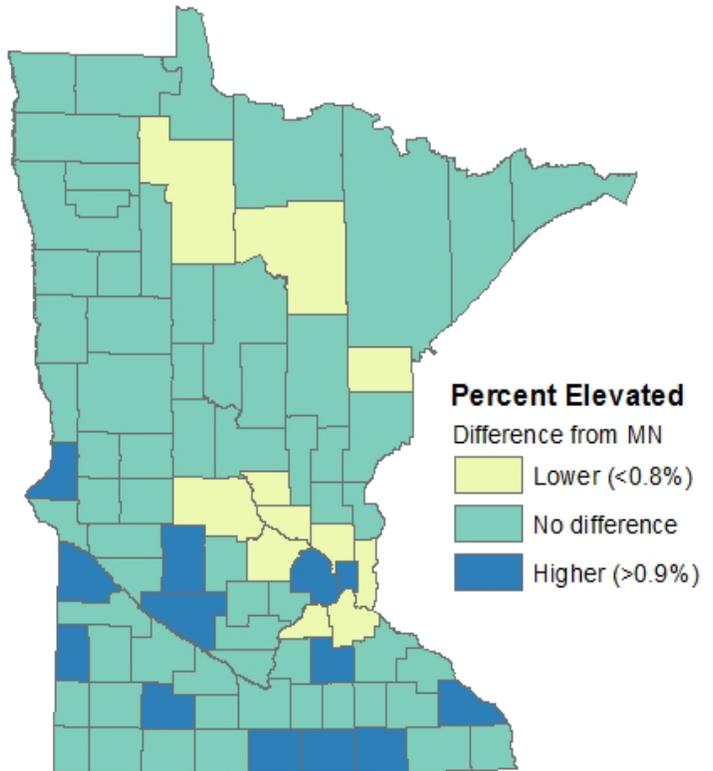
MDH guidelines recommend follow-up blood lead tests for children with elevated blood lead levels. The period of time recommended for retesting varies according to the initial blood level, but the maximum time is 90 days for any child with a blood lead level of 5 µg/dL or greater (an EBLL). Of the 1,798 Minnesota children identified with EBLLs in 2015, 1,371 (76%) were first identified through a capillary test. Of these, 718 (52%) received a diagnostic venous test 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. Follow-up rates have been steadily increasing from 2011 through 2015. Further increasing the follow-up rate and reducing the time between tests will take the combined efforts of providers, case managers, families, and the MDH Lead Program.

### Geographic Distribution of Elevated Blood Lead Levels

Hennepin and Ramsey are the counties of residence with the largest numbers of children with EBLs in Minnesota, representing over half of the children with EBLs during 2014–2015. Universal screening of all 1- and 2-year olds is recommended for residents of Minneapolis and St. Paul. The percentage of children tested for lead with a confirmed EBL, by county, for 2014–2015 is shown in **Figure 3**. Counties with high rates of EBLs are primarily in the inner-metro and the southern half of the state. This can be explained in part by the age of the housing stock in these areas. Area socioeconomic conditions also impact the prevalence of elevated blood lead levels in children. More deprived areas tend to have higher prevalences than less deprived areas with similarly aged housing stock.

**Figure 3. Percentage of children less than 6 years of age tested for lead who had confirmed results of at least 5 µg/dL, by county, 2014–2015. The statewide percentage was 0.89%.**



## Blood Lead Levels (BLL) in Adults

Adults can experience negative effects from exposure to lead such as increased blood pressure, stroke, kidney disease, and reproductive effects. Adults are generally exposed to lead in the workplace and these exposures can potentially impact both the individual and their family if lead-contaminated items such as clothing are taken home.

The National Institute for Occupational Safety and Health (NIOSH), CDC, and the State of Minnesota use a reference value of 5 µg/dL in adults, as well as children. The Minnesota Occupational Safety and Health Administration (MNOSHA) recently changed the BLL threshold at which they conduct inspections from 40 µg/dL down to 25 µg/dL. A BLL of 25 µg/dL or higher from an occupational exposure now triggers an inspection of facilities by MNOSHA.

In 2015, 9,392 blood lead test results were received from 8,068 adults. There were 457 adults with BLLs of 10–24 µg/dL, 44 adults with BLLs of 25–39 µg/dL, and 9 adults with reported levels of 40 µg/dL or greater. Of these 510 cases, 204 were newly identified cases in 2015. At least 83 percent of adults with reported elevated blood lead levels had documented occupational lead exposures. Data for 2016 are not yet available.

In 2016, MDH responded to a large-scale occupational lead exposure occurring at a shipyard in Northern Wisconsin involving Minnesota resident workers, in cooperation with the Wisconsin Department of Health Services. Workers at the shipyard were exposed while retrofitting the engine of a 690-foot vessel. There were 357 shipyard workers identified from nine states. Of those, 233 had blood lead tests, and elevated blood lead levels were recorded in 171 (73 percent). Levels 40 µg/dL or higher were recorded in 33 workers. The public health response involved interviewing workers and sharing health messages, including messages related to protecting children from take-home lead contamination. This outbreak will result in a large increase in the incidence rate and count of adult lead poisonings in Minnesota for 2016.

MDH revised the Minnesota *Blood Lead Screening Guidelines for Pregnant Women* in August, 2015 which are designed to assist health care providers in screening pregnant women for elevated blood lead levels. The updated guidelines reflect the current definition of an elevated blood lead level ( $\geq 5$  µg/dL), provide additional details on sources of lead, and include resources specific to Minnesota.

## Studies and Projects in At-Risk Populations

### Lead Exposure among Children Enrolled in Medicaid

Medicaid's Early and Periodic Screening Diagnosis and Treatment 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 more than twice as likely to have EBLs as non-enrolled children.<sup>2</sup> However, this disparity may differ between states and the CDC has recommended states develop screening plans consistent with their local risk patterns.<sup>3</sup> An analysis of

Minnesota data from 1999-2003 showed that Medicaid enrolled Minnesota children were twice as likely to have EBLLs as other Minnesota children.<sup>4</sup>

### Lead Exposure among Refugee Children

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. A blood lead test is included in the standard schedule of medical checks for incoming refugees. In recent years, the majority of refugees arriving in Minnesota have originated from East Africa and Southeast Asia.

Blood lead tests were matched to refugee information. During 2014–2015, about 10 percent of refugee children less than 17 years of age have had an EBLL of at least 5 µg/dL during their intake exam. Refugee children less than six years of age receive routine follow-up from their local public health department following the same guidelines as other children with EBLLs. For children older than six years of age, the main source of education and follow-up is their primary care provider.

### Lead in Drinking Water

The ongoing crisis in Flint, Michigan has highlighted the issue of lead in drinking water. The ESA Section and ALC Unit provide technical assistance to the Drinking Water Protection program. MDH also provides technical assistance to the Department of Education in testing for and responding to lead in drinking water in homes and schools. This includes examining blood lead testing data in populations that may have been exposed to lead in drinking water. However, the blood lead testing data available is often not sufficient to represent populations such as school-aged children since the majority of blood lead testing data is collected through routine early childhood screening among children under six years of age. Where existing data are not sufficient, MDH can assist in planning for and providing blood lead testing to potentially exposed populations.

In addition, the ALC Unit is increasing its efforts to ensure that risk assessments provided to children with EBLLs include lead tests of drinking water when this could be a source of the child's lead exposure.

## Screening and Case Management

MDH has developed and periodically updates a set of four guidelines for lead: Blood Lead Screening for Pregnant Women, Childhood Blood Lead Screening, Childhood Blood Lead Case Management, and Childhood Blood Lead Clinical Treatment. 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 <http://www.health.state.mn.us/divs/eh/lead/guidelines/index.html>.

MDH also provides technical assistance to all local public health agencies in Minnesota to ensure case management activities and follow-up testing for children and pregnant women are performed consistent with MDH guidelines.

The latest revision of the case management guidelines in 2011 included additional medical case management activities for test results between five and 10 µg/dL. This has dramatically increased the number of cases for MDH and local public health nurses across the state. Prior to the implementation of the new guidelines, at the end of state fiscal year 2011, there were 67 open cases requiring additional action. As of January 2017, there were over 1,600 open cases. The increase in caseload for both state and local lead program staff emphasizes the need for continued support for the program. The next revision of the case management guidelines will be released in 2017.

## Environmental Case Management

Minnesota Statutes, section 144.9504, requires assessing agencies to ensure that children with blood lead levels greater than or equal to 15 µg/dL are provided risk assessment services to limit exposure to lead hazards. Assessing agencies may also conduct lead risk assessments and issue lead hazard reduction orders (orders) on a property for any child with an EBLL (≥5 µg/dL), as resources allow. MDH conducts risk assessments for children with blood lead levels of 5–14 µg/dL with extenuating circumstances or as resources permit.

A licensed lead risk assessor working under an assessing agency opens the environmental case on affected properties. A lead case manager and local public health professionals are also involved with education and follow-up with the affected family.

The basic steps in the environmental case management process include:

1. Conducting lead risk assessments at the affected property or properties;
2. Issuing orders to the property owner; and
3. Conducting lead clearance testing after lead hazard reduction work is completed and is then verified by the assessing agency.

An environmental case closure occurs when all Lead Hazard Reduction (LHR) orders are completed and a clearance inspection demonstrates no deteriorated lead paint, bare soil, or lead dust exceeding standards exist at the affected property or properties.

## ALC Unit Compliance and Enforcement

The 2015 American Community Survey estimates that Minnesota has nearly 2.4 million housing units, with over 507,000 of those units built before 1950, down from over 560,000 pre-1950 houses in 2005. Homes built prior to 1950 are the most likely to contain the highest levels of leaded paint. The ALC Unit ensures through compliance monitoring and enforcement that the public receives safe and proper lead hazard reduction, evaluation, and analytical services by

requiring those services to be conducted according to state regulations, and by trained and licensed individuals and certified firms. The ALC Unit licenses lead risk assessors, lead inspectors, lead workers, lead supervisors, and lead project designers, and certifies firms who conduct regulated lead work. In addition, the ALC Unit approves and permits initial and refresher lead training courses for the above-mentioned disciplines.

**Table 1** reflects the current number of lead licensed individuals in Minnesota as of January 2017. 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 in Minnesota.

**Table 1. Total Number of Credentials Issued  
Across Minnesota – January 2016 to 2017**

Credential Issued	Total in MN
Certified Firm	183
Inspector	1
Project Designer	9
Risk Assessor	176
Supervisor	266
Worker	180
Lead Sampling Technicians	39

MDH was authorized by the EPA in September 1999 to administer and enforce the Minnesota Lead Poisoning Prevention regulations (lead regulations). The lead regulations allow regulated parties to obtain lead accreditation within Minnesota, which reduces the burden on EPA operating the lead abatement program. As permitted training courses are presented and their performance monitored, the quality of lead-related personnel in Minnesota is ensured. This, along with monitoring the conduct of licensed individuals, certified firms, and training course providers, helps to protect the public health as regulated lead work is performed in pre-1978 residences and child-occupied facilities (affected properties).

The goal of regulation and enforcement in the MDH lead abatement program is to limit lead exposure for children and pregnant women with EBLLs and their families, and increase their understanding of lead-related health hazards by ensuring compliance with the lead regulations. This regulatory role contributes to the core public health function of assurance: making physical environments safe and healthy.

EPA implemented the Pre-Renovation Education (PRE) and Renovation, Repair and Painting (RRP) regulations in April 2010. The purpose of the PRE/RRP regulations is to safely address and control lead painted surfaces impacted by renovation and maintenance activities in affected properties. The PRE/RRP in Minnesota is currently administered by EPA Region Five. The EPA compliance model has limited capacity and resources to provide sufficient outreach and enforcement that ensures renovation firms are protecting the public from lead exposure.

Establishing a PRE/RRP in Minnesota will fill in major gaps by providing direct outreach and education, evaluation of work practices, and additional credentialing of lead professionals.

The ALC Unit is developing PRE/RRP rules in order for MDH to become an EPA-authorized state program. Becoming an EPA authorized state would allow regulated parties to obtain accreditation, training and compliance assistance within Minnesota and provide a local enforcement presence for conducting compliance monitoring of renovation work in affected properties. The goal is to have an authorized program established during Fiscal year 2018.

## Compliance Monitoring

MDH is the primary agency for regulating lead-activities in Minnesota. MDH provides leadership on Lead Hazard Reduction (LHR) program issues and works closely with federal, state, and local agencies, and other interested parties. Compliance monitoring involves efforts by the ALC Unit 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. EBLI investigations are conducted by the ALC Unit to identify actual and potential environmental sources of lead exposure for persons with EBLIs. The ALC Unit is responsible for performing environmental investigations in areas not covered by a local assessing agency.

## 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 six providers offer training courses for the six disciplines located in **Table 1**. Additional information can be found at: [www.health.state.mn.us/divs/eh/lead/training/index.cfm](http://www.health.state.mn.us/divs/eh/lead/training/index.cfm).

Training 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 the lead poisoning prevention regulations. Compliance staff routinely audit training course providers to ensure that training course content and student training materials contain all the required topics and modules.

## 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 properties. The monitoring includes both notices and inspections. Enforcement activities are conducted in accordance with the Health Enforcement Consolidation Act

(Minnesota Statutes, sections 144.989 to 144.993) and the Plan for the Use of Administrative Penalty Order, Cease and Desist Authority, and Other Enforcement Tools. MDH also provides compliance assistance and consultation to the regulated community and others by providing information on regulated lead work and compliance issues observed during routine and follow-up inspections.

**Table 2** reflects the number of LHR 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. LHR notices are required when the “intent” of the work is lead abatement or interim control work or a combination of both. MDH conducts inspections of LHR projects based on notification submitted by certified lead firms and licensed individuals. The numbers reflected in this table are based on the federal fiscal cycle years 2015 and 2016. A federal fiscal cycle year runs from October 1 to September 30.

The number of field inspections, compliance audits, and desk reviews is based on benchmarks defined in the work plan submitted and approved by EPA Region Five. Compliance audits include the review of risk assessment reports, inspection reports, clearance inspection reports, and LHR reports. Desk reviews include the formal review of training course materials as part of the training course permitting approval process.

**Table 2. Number of Lead Hazard Reduction (LHR) Notices and Compliance Activities for Federal Fiscal Cycle 2015 and 2016**

Item	2015	2016
LHR Notices	357	307
Training Course Permits	27	19
Training Course Notifications	109	112
LHR Inspections	42	45
LHR Report Audits	23	25
Training Course Audits	29	31
Advisory Letters	3	3
Compliance Letters	79	79
Enforcement Cases	14	13

## Health Education and Outreach

The MDH Lead and Healthy Homes Program (LHHP) currently performs outreach and education activities for health care 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.

## Collaborative Workgroups

The development and implementation of effective lead poisoning prevention strategies are collaborative activities. Success requires strong partnerships between public health agencies, health care providers, housing agencies, non-profit organizations, and individual citizens.

The ALC Unit annually convenes contractors, firms, trainers, risk assessors, and other professionals engaged with lead regulated work activity. Updates are provided on enforcement actions by the EPA with regard to the RRP regulation compliance findings by inspections staff, HUD regulations that impact affected properties, state policies for medical and environmental case management, and information on innovative technologies and regulatory updates.

The MDH LHHP participates in the Minneapolis Healthy Homes Network. The Healthy Homes Network is chaired by the Minneapolis Department of Health and Family Support and brings together public health, community health, managed care organizations, and housing organizations to discuss and plan lead poisoning prevention and healthy housing strategies.

The MDH LHHP also participates in the Minnesota Collaborative Lead Education and Assessment Network (M-CLEAN), which is a workgroup that discusses lead exposure prevention initiatives and legislative developments. Membership is open to all interested stakeholders and often included local public health agencies, other governmental agencies, community action agencies, non-profit organizations, and industry groups.

## Outreach

The MDH LHHP has collaborated with community partners through Swab Team Services Grants since 2006. The grants are authorized under Minnesota Statutes, section 144.9512. MDH's Swab Team Services Grants provide nonprofit organizations with funding to increase the screening of children and pregnant women, organize lead screening events in communities with high lead exposure, provide outreach and education services when elevated blood lead levels are identified, and provide swab team services to protect populations from lead hazards in their residences.

The MDH LHHP provides educational material in multiple languages to assist with these efforts, including Spanish, Somali, Karen, and Hmong.

## 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](http://www.health.state.mn.us/divs/eh/lead). The site contains numerous fact sheets, a list of

“frequently asked questions” and responses, publications and reports, a downloadable version of a lead education workshop, and links to external lead resources.

The ALC Unit is continuing its efforts in providing lead-safe work practices information and brochures to licensed residential contractors in the state, including information at the department’s website: <http://www.health.state.mn.us/divs/eh/lead>. EPA’s Renovate Right brochure was modified in September 2011 with new graphics and updated information. Residential contractors and other related construction trades are required to provide the EPA Renovate Right brochure when conducting renovation work in affected properties.

MDH also maintains a healthy homes webpage, available at: <http://www.health.state.mn.us/divs/eh/homes/index.html>. Information is available on asbestos, asthma, carbon monoxide, drinking water, food safety, injury prevention, lead, mold/moisture, pest management, radon, ventilation, and volatile organic compounds.

## Swab Team Services Grants

Swab Team Services grants are authorized under Minnesota Statutes, section 144.9512. A request for proposals (RFP) from nonprofit organizations was issued during the summer of 2015. For October 1, 2015–June 30, 2017, \$838,250 in grant funds were available. The current grant recipients are [CLEARCorps USA](#) and [Sustainable Resources Center](#).

Swab team services are activities that provide protection from lead hazards primarily through the use of interim controls. Examples include thoroughly cleaning the residence using methods that do not further spread lead dust, removing loose paint, repainting, and covering or replacing bare soils. In addition to providing swab team services, the purpose of the Swab Team Services Grants is to:

- Increase lead screening among children under 6 years and pregnant women in populations at high risk for lead exposure
- Conduct lead screening events in communities with high lead exposure
- Provide education and outreach services regarding the home environment so that residents are protected from lead hazards

From October 2015–January 2017, over 550 children and pregnant women received blood lead testing through the Swab Team Services Grants. In this group, 27 (about 5 percent) were newly identified as having elevated blood lead levels. This indicates those tested were at high-risk for lead exposure since about 1% of children tested statewide have elevated blood lead levels. In addition, over 150 educational events were conducted throughout the state. Grantees are on track to meet grant objectives; culturally-appropriate home visits were made to 298 families, and swab team services were provided in 50 homes. Finally, training on how to safely control lead was provided to over 90 individuals.

# Healthy Homes Grants

In 2014, the Minnesota Legislature passed Minnesota Statutes, section 144.9513, which defined healthy housing and established a healthy housing grant program that awards \$240,000 in grants annually. In July 2014 MDH issued an RFP for community health boards, 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 Health Care/Secondary Prevention

Each grant agreement is 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. Grantees were distributed through the metro and non-metro areas of the state, and are listed below and shown in the map (**Figure 4**).

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

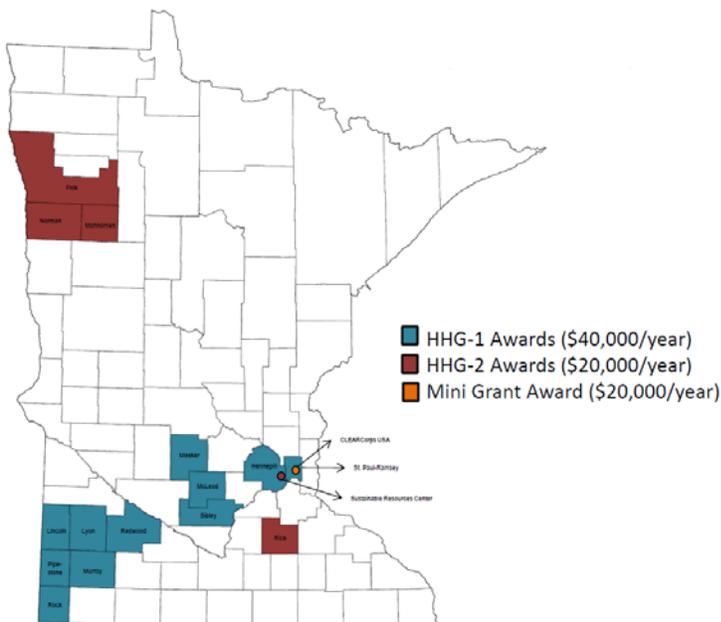
Awards of \$20,000 Per Year:

- Polk-Norman-Mahnomen Community Health Board
- Rice County Community Health Services
- Sustainable Resources Center

Mini Grant Award Administration

- CLEARCorps USA
- Examples of funded mini grants include:
  - Spring Lake Park Fire Department: Visiting homes in a specific mobile home park to identify healthy homes issues and distribute safety devices
  - Rebuilding Together: Organizing community meetings that include education about healthy homes issues

Figure 4. Grant recipients for the 2014 Healthy Homes Grants



# Legislative Activities

According to Minnesota Statutes, section 144.9501, an EBLL is defined as a diagnostic blood lead test of at least 10 µg/dL in any person, unless the commissioner finds that a lower concentration is necessary to protect public health. On April 16, 2014, the Commissioner found that this definition was insufficient to protect public health. The new threshold for an EBLL is 5 µg/dL, which is consistent with the latest scientific literature and current MDH case management and clinical treatment guidelines. The new definition is also consistent with the current CDC “reference level” for lead. Decreasing the threshold for an EBLL gives MDH and lead assessing agencies additional regulatory authority to ensure that lead hazards are addressed.

MDH was authorized during the 2009 Legislative Session to adopt rules consistent with sections 402(c)(3), 406(a) and 406(b) of the Toxic Substance Control Act also known as the RRP and PRE regulations. According to MS 144.9508, the Commissioner is required to create rules for oversight of renovation work or maintenance work that impacts lead paint in affected properties. MDH received legislative approval in August 2015 to develop PRE/RRP rules and rulemaking is currently underway.

The ALC Unit and the Health Risk Intervention 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.

Lead program staff members are regularly called upon to provide data, background, and technical perspective on bills addressing lead poisoning and healthy homes.

# Policy Planning and Program Evaluation

## 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. The completeness of data and the timeliness with which it is reported and entered in the database are reviewed annually. Results of this review are shared with the reporting laboratories, and MDH collaborates with the laboratories to continually improve the quality of their data.

## Strategic Plans

MDH continues to implement both the Minnesota Childhood Lead Poisoning Elimination Plan, which was revised in 2011, and the Healthy Homes Strategic Plan, which was released in 2012, both of which are intended to be in alignment with the MDH Strategic Plan. These plans guide the program as it builds program capacity, collaborates with internal and external partners, and plans for the future.

## Healthy Homes

As the first round of healthy homes grants will conclude in early 2017, MDH has an opportunity to revise and improve the grant program prior to distributing the second round of grants. This will include collecting information on facilitators and barriers to success from current grantees and using these to set performance measures for the second round of grants.

MDH will continue to work to transition a portion of lead program capacity to address multiple housing-based health threats in high-risk populations.

## Funding Status

The bulk of funding for the MDH lead program has traditionally come from federal sources via grants and cooperative agreements. State general funds are also important to address lead poisoning in Minnesota. MDH receives about \$230,000 from the general fund annually. 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). In addition, the ongoing crisis in Flint, Michigan has highlighted the issue of lead in drinking water in homes and schools, as well as the importance of a strong state lead surveillance system.

Although federal funding for lead poisoning prevention and surveillance activities has fluctuated in recent years, the MDH lead program received a three-year grant of \$385,000 annually for federal fiscal years 2014–2016. Those funds were authorized through the Affordable Care Act through the Prevention and Public Health Fund and are expected to continue through September 29, 2017. A repeal or replacement of the Affordable Care Act could jeopardize this important source of funding. The program also received \$10,000 from the National Institutes of Occupational Safety and Health (NIOSH) for adult blood lead surveillance.

MDH has received Lead Cooperative Agreement and Enforcement grants from EPA since 1994. The funding amount has averaged about \$245,000 for each of the past two years. This funding has provided ongoing development and support for the infrastructure of the ALC Unit. 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 levels 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 was appropriated at \$107,000 for SFY 2016 (July 1, 2015–June 30, 2016). This revenue is generated from license, certification and permit fees. MDH does not charge a fee for the independent lead exams or to register lead sampling technicians. Currently, MDH regulates 183 certified firms, 632 licensed individuals, 6 training organizations, and 39 registered individuals. A small number of lead professionals (risk assessors) are employed by local government (e.g., assessing agencies) and are exempt from credentialing fees. Following adoption and self-certification of a PRE/RRP program in Minnesota (to begin during FY 2018), the ALC Unit will be collecting fees from renovation firms and training organizations seeking accreditation.

For October 1, 2015–June 20, 2017, MDH awarded a total of \$838,250 in state-funded Swab Team Services Grants. The current grantees are Sustainable Resources Center and CLEARCorps USA. The grants are authorized under Minnesota Statutes, section 144.9512, subdivision 2, to provide swab team services training to workers and property owners, and provide swab team services on affected properties. Grant funds may also be 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.

In 2014, a healthy housing grants program was established by Minnesota Statutes, section 144.9513. A total of \$300,000 annually was appropriated for the program; the MDH LHHP receives \$60,000 of the appropriated funds to administer the program. Eight grants of \$20,000–40,000 have been awarded through this program for 2014–2017, and the recipients are distributed throughout the state.

As noted in the 2014 Economic Burden Report the total economic burden of childhood lead poisoning in Minnesota for children born in 2004 is estimated to be \$1.9 billion.<sup>5</sup> Therefore, it is critical that state funding continue to support the program, help leverage federal support, and ensure that future generations are not burdened with the negative impacts of lead poisoning.

## Future Directions

Future directions for the Minnesota Department of Health are largely determined by the requirements set by funding providers (e.g. CDC and EPA) and the state legislature.

Lead program staff will continue to actively improve the recording and transfer of lead test data. The BLIS database will require upgrades in the future to meet the technological needs of the program, and to increase flexibility as it expands to incorporate healthy homes data.

Education, compliance assistance, compliance monitoring, and enforcement of lead poisoning prevention regulations continue to be priorities for the state as part of federal grant funding provided by Region Five EPA. Lead compliance staff are actively involved in public education, compliance assistance and monitoring, and routinely respond to public inquiries and data requests regarding general indoor air, lead and asbestos issues. Compliance and administrative staff have the necessary training and skills to ensure that compliance and enforcement activities are conducted in accordance with standardized processes and policies.

Becoming an EPA authorized state for the PRE/RRP regulations is a high priority for MDH. Since August 2015, an internal review of the draft PRE/RRP regulation was completed. The Office of the Governor approved the preliminary form for the administrative rule relating to PRE/RRP development on March 24, 2016. MDH published in the State of Minnesota - State Register the Request for Comments on New Rules Governing Lead Renovation, Repair, and Paint in February 2016.

MDH convened an advisory committee in November and December 2016. The committee met three times and provided valuable feedback to MDH. Since that time, the department submitted its final draft of the PRE/RRP to the Office of the Revisor for review. Following a formal comment period and a review by the Office of Administrative Hearings, MDH anticipates it will self-certify the PRE/RRP program with EPA during FY2018. EPA has a six-month period following self-certification to authorize the Minnesota PRE/RRP program.

Health education is performed by all staff within the lead program using 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 LHR efforts to ensure complete and timely resolution of orders.

It will be a challenge to incorporate consistent healthy homes messages in the lead program and all of the diverse collaborating organizations. However, many agencies are very excited about the potential for increased capacity to address a range of housing-based health hazards and are looking forward to new ideas and approaches to promoting public health. The program will strive to remain flexible, responsive, and grounded in the core public health functions of assessment, assurance, and policy/planning.

## Conclusions

Lead is a preventable 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 and lead-containing dust.

The MDH blood lead surveillance system collects blood lead reports on all tested 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. While very high lead exposure levels have thankfully become relatively rare in the state, there are many high-risk areas where lead remains as a significant public health threat.

Compliance monitoring and enforcement ensures that LHR work is completed in accordance with state regulations and best public health practices. This involves working with assessing agencies and the regulated community to address exposure issues in affected properties. Training is provided to homeowners and contractors, inspections are performed on LHR projects, and risk assessments and lead inspections are 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.

Transition of lead resources to healthy homes needs to continue in order to address housing-based health threats. Successfully implementing healthy homes will involve expanding program relationships to include additional housing and health organizations, an upgrade of data collection systems, and development of new policies

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