

# **Minnesota's Lead Poisoning Prevention Programs**

## **Biannual Report to the Legislature**

**February 2003**

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**Minnesota Department of Health - Lead Poisoning Prevention Programs  
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## **Executive Summary**

The State of Minnesota has consistently played a leading role in identifying and addressing public health issues related to lead exposure. The current 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 high levels of lead. This report documents activities conducted by MDH between February 2001 and February 2003. Additional background information on lead issues and a comprehensive overview of basic roles and procedures for the MDH Lead Program is presented in the 2001 legislative report and is not reproduced in this document.

The lead surveillance database continued to collect information on all lead tests performed on Minnesota residents. Work on a new system, which will allow greater data security and secure external links with partners, was initiated. The current data indicates that there was a significant increase in the number of tests performed, reflecting a growing awareness of the need to check for potential exposure to lead. The number of elevated cases has been gradually decreasing, which is consistent with national trends. There also were several key studies performed using the lead surveillance system, including a rural prevalence study, an examination of lead testing in children on Medicaid and having immigrant status, and an effort increase screening in suburban areas with high risk factors. The state lead guidelines for screening, case management, and clinical treatment were evaluated and will be amended as needed in the future. A State Case Monitor was hired to help guide case management of elevated lead, which resulted in a growing role for MDH in assisting 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 has been accomplished by promoting education and compliance training, licensing of lead professionals and certification of 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 services available which serve and protect public health. A major activity of the program was to rewrite the lead poisoning prevention rules as a result of changes to the lead poisoning prevention act in during the 2001 legislative session. These rules are being rewritten with the goal of incorporating changes to reduce the prevalence of lead poisoning in Minnesota. Additional funding through federal agencies is allowing the program to enhance elements of the program. 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 blood lead levels appear to be declining nationally, a high level of commitment will be required from the state if we are to effectively reach the remaining at-risk populations. Those populations tend to be diverse, under-served, and highly mobile. They 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 program capacity, addressing known gaps in our current knowledge, and assuring effective use of limited funds. These activities will include:

- Working with 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.
- Continuing examination of trends in lead poisoning in the Minnesota childhood Medicaid population and the development of collaborative efforts to reduce exposure and fully utilize available resources.
- Working with health plans to promote awareness of lead, ensure appropriate delivery of services to at-risk children, and sharing information to most accurately identify areas of high risk for lead exposure across the state.
- Conducting feasibility studies on the use of electronic data transfer to help ensure that current reporting systems are secure, complete, accurate, and compatible with national databases that may be developed in the future, and transfer to Oracle database for statewide surveillance data
- 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 labs and clinics, and distribution of data reporting outcomes to partners.
- Revising state rules to incorporate changes in technology and our understanding of issues related to lead to reduce the prevalence of lead poisoning in Minnesota.
- Continuing current efforts to evaluate program effectiveness in order to ensure optimal use of limited resources.
- Continued networking, as funding allows, with Minnesota Child and Teen Checkup programs, WIC, and Weatherization Programs.
- Increased educational outreach, especially to pregnant women and women of childbearing age and other at-risk populations.
- Developing an outreach system for general rehabilitation contractors working on residential projects to educate them about the hazards associated with working with lead based paint.
- Developing an interactive database for the regulated community to complete notification requirements on-line to reduce data delays and program expenses.
- Continuing to evaluate compliance monitoring efforts to ensure that a properly trained and skilled lead workforce exists and will continue to increase in numbers throughout Minnesota.
- Continuing to provide education tools and materials to reduce lead poisoning cases among children and adults.
- Continuing to provide compliance assistance opportunities and presentations to the public and the regulated community.

## Introduction

This biannual 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 biannually, 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. It included an overview of public health concerns associated with lead exposure, documented basic protocols and standard operating procedures related to characterizing and preventing lead poisoning by MDH, presented the status of current funding sources, and evaluated likely future directions for state-level lead programs. The complete 2001 report is available at the MDH website at: [www.health.state.mn.us/divs/eh/lead](http://www.health.state.mn.us/divs/eh/lead). Rather than duplicate the information in this extensive document, the current report will only present information and updates on activities occurring during February 2001 to January 2003. Due to the time lag involved in collecting, analyzing, and reporting data, some information prior to 2001 may also be presented.

This report cost \$3000 to prepare, including staff time, printing, and distribution costs. Information used to compile this report was obtained from MDH files and publicly available sources, and is available upon request. The complete 2003 report may also be found at the MDH website at: [www.health.state.mn.us/divs/eh/lead](http://www.health.state.mn.us/divs/eh/lead).

## Current State Lead Programs

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

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

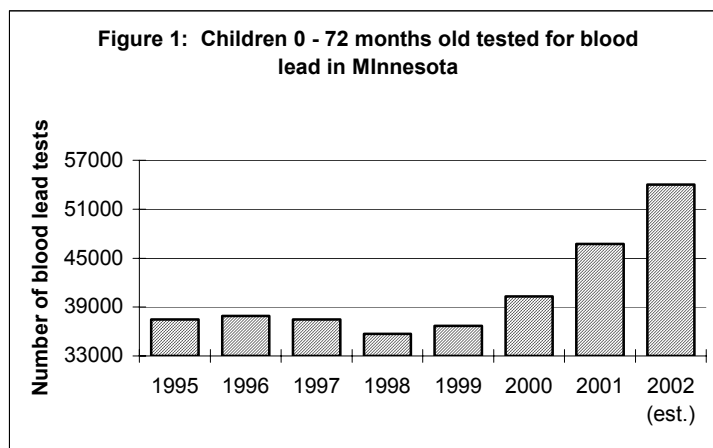
## I. Surveillance Activities

The MDH maintains an extensive blood lead surveillance system for the purpose of monitoring trends in blood lead levels in adults and children in Minnesota. As of January 1, 2003 the database contained 493,272 records of blood lead test results from 334,330 individual Minnesota residents dating back to 1995. The data are used to help identify populations at risk for elevated blood lead levels (EBLLs). The surveillance system then uses this information to help ensure that screening services are provided to groups identified as having the highest risk of lead poisoning and that environmental and medical follow up are provided to children with EBLLs.

It is impossible to draw specific conclusions regarding the actual rates of lead poisoning in Minnesota based upon these data. Since there is no universal testing among children, those tested are not representative of the entire population. Additionally, comparison of numbers of children with elevated blood lead levels between counties is not appropriate since the number of children tested in most Minnesota counties is small. However, it is possible to use the data 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. This section presents data on lead poisoning in children less than six years old and adults, an overview of projects targeted to at-risk populations, and work on MDH state-wide lead guidance.

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

Figure 1 compares the number of children tested in past years and gives some indication of how screening practices may have changed. The number of blood lead tests reported statewide was smallest in 1998 and has been increasing since. This increase may be due, in part, to the efforts of MDH and other agencies involved with lead poisoning prevention to raise awareness of childhood lead poisoning and the development of state-wide screening, case management and clinical treatment guidelines. Only data for children less than six years old are presented.

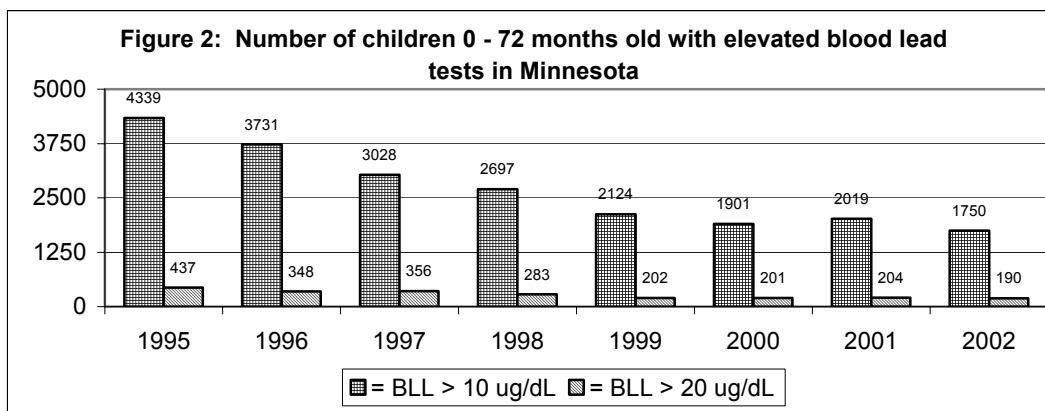


The decline noted in 1998 may be partially the result of CDC changing their national recommendation for universal screening to targeted screening in 1997. As high-risk areas were better defined, the benefits of lead testing more widely understood, and educational efforts

matured, the screening rate has increased. In addition, the release of the MDH Blood Lead Screening Guidelines for Minnesota in March 2000 has likely played a significant role in the dramatic increase in screening over the past 3 years. Data for 2002 is estimated due to a time lag in reporting from the analytical labs to MDH for tests < 10 µg/dL (e.g. not considered “elevated”). It can often take several months for these reports to be processed into the MDH surveillance database. The Lead Program is addressing this issue by promoting use of electronic reporting formats, which allow for greater efficiency in handling large numbers of records.

Since not all Minnesota children have a high risk for lead exposure, targeted screening is currently recommended for most areas of the state rather than universal screening. The goal is to test all children at risk for exposure to lead. Therefore, because not all Minnesota children are exposed to lead risk factors, the optimal level of screening will be less than 100 %.

The trends in the number of EBLL cases (e.g. venous tests greater than 10 µg/dL) in Minnesota children may also be compared across years (Figure 2). The general downward trend shown in Figure 2 is consistent with national trends, but should not be used to conclude that lead is no longer a significant public health threat in Minnesota. Results are also shown for cases greater than 20 µg/dL, which is the level above which an environmental assessment is required to identify and mitigate lead exposure. Approximately 85 % of the reports above 20 µg/dL in Minnesota come from just two counties (Hennepin and Ramsey), indicating that in specific areas of the state lead poisoning continues to be a major public health problem. For this reason, the Minnesota screening guidelines recommend universal testing in the cities of Minneapolis and St. Paul.



While the rate of lead screening increased during the 1999 - 2002 period, the number of EBLL cases stayed relatively constant. Although these data are difficult to interpret due to many confounding factors, this lack of a concurrent increase in elevated lead cases may be due to problems in communicating with and screening the highest-risk populations. It may be that, had the inefficient universal screening recommendation remained in place, the number of identified elevated lead cases would be even smaller than is currently reported. In addition, the relative flatness of the lines for 1999 - 2001 for cases greater than 20 µg/dL may indicate that the amount of lead exposure is declining (e.g. the percentage of kids tested who have an EBLL is dropping) in Minnesota. Regardless, it is safe to conclude that the average blood lead level in Minnesota has declined over the past seven years.

To improve data security and expand reporting options, the MDH lead program is switching the operating software for the surveillance system to an Oracle database. The new database will increase data entry accuracy and save time by allowing laboratories or clinics to report via the web. Currently, data entry forms are being tested and directories are being created for cities and counties, clinics, and patients. After reports are developed, data entry will begin on the new Oracle database in early 2003. The new database is also compatible with other current and projected state agency systems for data transfer

Minnesota's Adult Blood Lead Epidemiology and Surveillance (ABLES) program began identifying eligible adults on January 1, 1998 and continued through the current reporting period. Adults with venous blood lead levels of 40 ug/dL or greater are identified in the surveillance system, enrolled in the program, interviewed to determine the sources of their high lead levels, and provided with educational resources. Lead testing data reported to MDH for adults in Minnesota are presented in Table 1.

**Table 1: Number and range of Minnesota residents 18 years or older reporting a blood lead test**

<b>Year</b>	<b># of reports</b>	<b># of individuals</b>	<b>Range of reported results</b>
<b>2001</b>	5267	4346	<3 to 80 ug/dL
<b>2002</b>	5151	4309	<3 to 62 ug/dL

Of those adults who submitted a test, there were 55 Minnesotans enrolled into the ABLES program in 2001 (e.g. reported levels greater than 40 µg/dL) and 39 in 2002. Through a combination of phone interviews and laboratory reports, information on the source of lead exposure was obtained for all new ABLES enrollees. In some cases, however, lead exposure information was unavailable. Individuals received lead exposure through their jobs (recycling and smelting of nonferrous metals, working with glass or ceramic products, and casting lead fishing sinkers) or through a hobby or other non-occupational lead source (an artist working with lead-containing paint, a hobbyist reloading bullets, and a prisoner working with lead solder).

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

Minnesota Lead Data Match Project

National studies have shown that Medicaid-enrolled children are three times more likely to have elevated blood lead levels (above 10 ug/dl) 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 if testing has not previously been done. Despite the requirement, nationally only about 19 % of Medicaid-enrolled children ages 1 to 5 are tested nationwide.

While national research suggests that children enrolled in Medicaid are at increased risk for elevated blood lead levels, no Minnesota-specific data on blood lead levels in Medicaid-enrolled children have previously been available. Minnesota Department of Human Services (DHS) administrative data contain information about whether children receive blood lead testing, but do



not contain information about lead test results. A DHS file containing records of children age six and under who were enrolled in Medicaid between 1995 and 1998 was provided to MDH. This file was matched against MDH's blood lead surveillance database, which contained children under six who had a lead test reported between 1995 and 1998. A seven-step iterative process was used to link information on children enrolled in Medicaid who received blood lead testing. Combining the two data sets allowed the state to determine the rate of elevated lead levels among Minnesota Medicaid-enrolled children who received blood lead testing.

According to the study, children enrolled in MHCP had higher lead poisoning rates (Table 2). Approximately 10 % of Minnesota children under age 6 are tested for lead poisoning each year. Of those tested and found to have EBLLs between 1995 and 1998, 72 % were enrolled in MHCP. MHCP children were nearly twice as likely as non-MHCP children to have EBLLs (9.8 % compared to 5 %). The good news is that the percentage of MCHP children with EBLLs declined in each year of the study. These results are consistent with national trends and likely reflect the overall decline in lead exposure across the country. However, the continuing disparity between groups is a significant concern and is one of the primary areas of emphasis for the Lead Program in the future.

**Table 2: Percentage of Children with Elevated Blood Lead Levels**

	1995	1996	1997	1998
<b>MHCP Children</b>	16.2%	13.3%	10.7%	9.8%
<b>Non-MHCP Children</b>	6.7%	5.6%	4.9%	5.0%

Despite their high-risk status, Minnesota's MHCP children had extremely low blood lead testing rates (Table 3). Not only were testing rates low, but rates also declined throughout the study period. Low testing rates existed, despite a federal requirement that all Medicaid children receive blood lead testing as a component of their 1- and 2-year-old EPSDT well-child visits. This study looked at 1- and 2-year-old MHCP who received such well-child care and found that only about one in four received a blood lead test. Had all MHCP 1- and 2-year-olds received testing during their visits, the overall lead testing rate for 1998 would have been 58.8 %, rather than 13.3 %. These data also point out that over 40 % of eligible children do not receive a recorded well-child visit, indicating a preventive health care delivery problem that extends beyond the lead issue.

**Table 3. Blood Lead Testing Rates for MHCP Children (9-30 months)**

	1995	1996	1997	1998
<b>Well-child</b>	26.2 %	24.7 %	23.1 %	22.6 %
<b>All MHCP</b>	14.9 %	14.5 %	13.6 %	13.3 %

Three-month follow-up testing rates for children with EBLLs were quite low. According to the study, only one-third of Minnesota children with EBLLs received the recommended follow-up testing within three months. MHCP children were less likely than non-MHCP children to receive follow-up testing within three months. While additional follow-up testing appeared to

take place beyond three months, rates for all children remained low.

Finally, the study showed that EBLLs, testing rates, and follow-up testing rates for MHCP children all varied by race/ethnicity. Lead poisoning rates were found to be higher for children of color compared to white children. At the same time, children in racial/ethnic groups with higher EBLLs generally had higher testing rates as well. The three-month follow-up testing rates tended to be higher for white and Hispanic children than for other racial/ethnic groups. However, it is important to note that the reason for higher rates of testing and their impact on lead poisoning rates by race/ethnicity are not available from the data.

There are a number of limitations to take into account when considering the findings of this study. Missing or incomplete data from MDH or DHS could affect study results. The data match, although rigorous, does not necessarily account for all possible true matches. Race/ethnicity data used in the above comparisons may be problematic because it may be incorrectly verified/recorded or because race or ethnicity status is unknown or uncategorized for a large percentage of blood lead test patients. The data do not represent true prevalence data because Minnesota Blood Lead Surveillance database is not representative of Minnesota population, and therefore not directly comparable to national studies of prevalence.

In conclusion, national research shows that Medicaid-enrolled children are a high-risk population. This study indicates that the same is true for Medicaid-enrolled children in Minnesota, and that this population is under-tested. Blood lead testing of MHCP 1- and 2-year-olds during EPSDT well-child visits is necessary in order to identify lead-poisoned children and to comply with federal testing requirements. This demonstrates the need to inform health care providers, as well as caregivers, about the importance of lead testing for MHCP children. In addition, the health care providers of all Minnesota children need to be informed of the importance of timely follow-up testing to ensure that interventions are successful and that children's BLLs are reduced to safe levels. More information is contained in the full-report and can be obtained from [www.health.state.mn.us/divs/eh/lead/reports/medicaidleadrpt.pdf](http://www.health.state.mn.us/divs/eh/lead/reports/medicaidleadrpt.pdf).

### Countryside (Public Health Department) Lead Prevalence Study

Most of what is known about childhood lead poisoning comes from blood lead tests performed in urban areas. About 77 % of the children in the Minnesota Blood Lead Surveillance database reside in urban areas. Lead testing varies greatly from county to county (0.6% to 15%), and many rural areas are high in lead poisoning risks: old housing, poverty, and lack of screening. The lack of an accurate, statistically sound prevalence rate for lead poisoning in rural areas inhibits long-term public health program planning by maintaining uncertainty in characterizing at-risk populations and challenges the ability to carry out the core public health functions of assessment and policy/planning.

For these reasons, a grant was prepared by MDH and funded in 2001 by CDC to examine lead poisoning prevalence in a representative high-risk rural area of Minnesota to:

- 1) Establish accurate prevalence rates for elevated blood lead levels in children in a high-risk rural area

- 2) Compare Medicaid population characteristics between rural and urban areas
- 3) Evaluate the efficacy of Minnesota Blood Lead Screening Guidelines in a rural area
- 4) Foster a cooperative working partnership between MDH and the Countryside Public Health Department, local clinics, primary health care providers, and other local organizations

Three counties in Western Minnesota served by Countryside Public Health Services were chosen as the site for the study. The overall project was started in 1998 with visits to all clinics in the area in cooperation with Countryside public health nursing staff. Clinics were interviewed regarding the potential for their cooperation in the project. Local cooperation and support was very strong. The second phase of the project involved the development of protocols and other methods to be used in collecting data. Methods were consistent with CDC and MDH recommendations for screening, testing, and case management. The third phase of the project involved the actual data collection, analysis, interpretation, follow-up, and generation of reports and publications. In general, a risk questionnaire was completed for each child to determine its predictive value for identifying lead poisoning risks in a pediatric, rural population. Then, all children up to 48 months old were tested for blood lead. Results will be summarized into a briefing paper and distributed back to the participating clinics, physicians, and parents of children in the study in addition to being submitted to scientific newsletters and peer-reviewed journals for publication. Compliance with data privacy restrictions will be periodically checked throughout the project and strictly enforced. Public health implications inferred from data trends will be used to better focus statewide lead program resources and activities. The characteristics of the study area are given in Table 4 below.

**Table 4: Study Area Characteristics (1990 Census data)**

<b>County</b>	<b>Children age &lt;6 below poverty</b>	<b>Housing built before 1950</b>	<b>Median value of homes</b>	<b>Reside on a farm</b>	<b>White</b>
<b>Chippewa</b>	19%	50%	\$35,000	18%	99%
<b>Swift</b>	19%	55%	\$28,000	18%	95%
<b>Yellow Medicine</b>	22%	53%	\$31,000	26%	99%

The participant recruitment period lasted one year, from 9/1/2001 – 8/31/2002. Packets were mailed to eligible families, and included the following: study brochure, letter, and consent/survey form. Reminder postcards were sent out two weeks after the packets were mailed. One month later, follow-up phone calls were made. Publicity for the study was conducted through TV, newspapers, posters, radio, and postcards. Dinosaur graphics, which appealed to children, were used on t-shirts, postcards, and posters to advertise the study activities.

Thanks to the dedicated hard work of the local public health agency, the collaborating clinics, and MDH staff, recruitment for the study was very successful. A lead test was performed on 1,127 of the 1,508 identified eligible children (75%). This high rate of participation will ensure that trends will be highly representative of the area and have statistical significance. Of the participants that had a blood lead test, 2.1% had EBLLs at or above 10 ug/dL and 0.7% had

BLLs at or above 20 ug/dL (Table 5). The estimated rates for the statewide database for 2002 are 4.3% above 10 ug/dL and 0.43% above 20 ug/dL. The complete implications of these results are still being evaluated and will be presented in final form in 2003.

**Table 5: Rate of elevated blood lead tests by county.**

	<b>Chippewa</b>		<b>Swift</b>		<b>Yellow Medicine</b>		<b>Total</b>	
<b>Tested Children</b>	399		394		334		1,127	
<b>Above 10 µg/dl</b>	19	3.3 %	8	1.5 %	8	1.5 %	35	2.1 %
<b>Above 20 µg/dl</b>	4	0.7 %	2	0.4 %	2	0.4 %	8	0.7 %

Medicaid and/or WIC status was examined in relationship to housing status for participants that completed both a lead test and a survey. Those participants receiving assistance were somewhat less likely to reside in home built before 1950. Although participants receiving assistance are also more likely to have elevated blood lead levels, the difference is small. However, all BLLs at or above 20 ug/dL are associated with participants receiving assistance.

Finally, blood lead levels were examined in association with the age of housing. The questionnaire requested information on the child’s residence or one that he/she visited regularly. Participants living in older housing were more likely to have high blood lead levels than participants living in newer housing. Again, all BLLs at or above 20 ug/dL resided or visited homes built before 1950. The data clearly indicate that Medicaid/WIC status and living in old housing were both important determinants of EBLL in rural areas.

#### Hennepin County Study

An example of an MDH lead program project that addresses low screening rates is the Hennepin County Project. Hennepin County Community Health Department (HCCHD) serves the entire county, with the exception of the city of Minneapolis. Minneapolis itself has higher screening rates than the rest of the state, partially because lead is a known problem in urban areas, and the Minnesota Screening Guidelines recommend that every child living in an urban area be screened.

Hennepin County is the most populous county in Minnesota. There are 46 municipalities in the county that can be grouped by distance from Minneapolis into first, second, and third ring suburbs (see Appendix 2 for maps). The locations of currently registered pediatricians and family practice physicians are also shown, indicating that the density of service providers decreases as one moves away from the city limits of Minneapolis.

In 2001, Hennepin County Community Health Department (HCCHD) epidemiology staff examined screening and age-of-housing data for Hennepin County. A combination of low screening and a large number of old housing was found in the third ring, leading MDH to concentrate resources there. Results from this project will demonstrate how well the chosen outreach strategies raise screening rates in respective clinics. Also, the project will show whether this total strategy will raise screening rates in the third ring suburbs. Data analysis is scheduled for June-August, 2003, with updates after project completion in September 2003.

## Study on Immigrant Status

Immigrant status is a known risk factor for lead poisoning. This association happens for one of two reasons: (1) it is possible that children were exposed in the country of origin, where lead exposures were not as strictly regulated as in the US, and (2) immigrants often have limited resources and may live in older, more affordable housing. Refugee children comprise a wide range of ethnic origins, as shown in Table 5. The rate of testing for children from Africa has decreased recently, even though the rate of EBLLs in African refugee children remained similar. Children from Eastern Europe still lag behind the African and Asian ethnic groups in testing. This lack of testing may be due to the attitudes or policies of the health care providers and/or resistance by the refugees. The children from Eastern Europe also have fewer EBLLs. For the total refugee population in 1999-2000, 76 % of incoming children who received a lead test were tested within three months of arrival.

**Table 5: Number and Percent of Refugee Children (0-72 Months) Tested and with Elevated Lead Levels from 1999-2000 Data by Ethnicity/Region of Origin**

Ethnicity/ Region of Origin	Refugee Children	Children tested for lead		Children tested for lead within 3 months of arrival		Children w/elevated level (10 µg/dL)	
Somalia	269	171	64 %	131	49 %	48	28 %
Liberia	93	70	75 %	60	65 %	20	29 %
Rest of Africa	117	81	69 %	57	49 %	17	21 %
SE Asia	26	16	62 %	13	50 %	3	19 %
Former Yugoslavia	95	47	49 %	38	40 %	0	0 %
Russia	28	13	46 %	7	25 %	1	8 %
Ukraine/Belarus/ Moldova	49	24	49 %	16	33 %	1	4 %
Rest of Former USSR	8	6	38 %	3	38 %	0	0 %
Middle East	7	2	29 %	2	29 %	0	0 %
Cuba	1	1	100 %	0	0 %	0	0 %
Philippines	1	0	0 %	0	0 %	0	0 %
Totals	694	428	62 %	327	47 %	90	21 %

### *C. Screening and Case Management*

The Childhood Blood Lead Clinical Treatment Guidelines for Minnesota, a document to guide clinician decisions on treatment and follow-up care of children who have had lead tests, was released in July, 2001. The Childhood Blood Lead Case Management Guidelines for Minnesota, a document to guide local public health personnel decisions on treatment and follow-up care, were released in June, 2001. These documents have the support and endorsement of the

Minnesota Medical Association (MMA), the Minnesota chapter of the American Academy of Pediatrics (AAP), and the Minnesota Academy of Family Physicians (MAFP). The Screening Guidelines are also endorsed by BlueCross BlueShield BluePlus, and the Treatment and Case Management Guidelines are endorsed by the Minnesota Nurses Association (MNA). MDH has distributed these documents statewide numerous times to clinics and laboratories. In addition, educational workshops have been held on an on-going basis to promote their use.

As a committed effort towards ensuring case management services for children with elevated blood lead levels, MDH hired a full time state case monitor to provide case management technical assistance to local public health case managers in February, 2001. The state case monitor provides technical assistance to 85 of the 87 counties within the state of Minnesota.

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 10ug/dl are performed consistent with MDH guidelines.
- ✓ communicating regularly with the ALCU unit to assess progress on open lead cases and facilitate communication between the ALCU unit and local lead case managers.
- ✓ holding educational workshops to educate medical professionals about the Minnesota guidelines for Screening, Treatment, and Case Management.

Since hiring the state case monitor, clinicians have improved their adherence to Minnesota Guideline procedures. A reporting and tracking form, and case monitoring database were developed in collaboration with local agencies. This allows for complete records on all medical cases and facilitates communication. One key issue resolved was the timely reporting back to local agencies when the follow-up test to an elevated capillary test is non-elevated (e.g. venous result < 10 ug/dL). This assisted in reducing case loads and helped give the local agencies the most current information available.

## **II. Compliance Activities**

The 2000 US 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 Program 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 Program was authorized by U.S. Environmental Protection Agency in September 1999 to administer and enforce the lead accreditation and compliance program in Minnesota. The program 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 Program approves initial and refresher lead training courses for these disciplines.

The goal of regulation and enforcement in the MDH lead program is to limit lead exposure for children with elevated BLLs 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 Minnesota lead rules which are being revised will also incorporate training requirements for lead

sampling technicians and interim control workers to better assist housing rehabilitation projects funded through U.S. Department of Housing and Urban Development (HUD) to perform work in a lead safe manner.

The goal of compliance activities, in the MDH lead program, is to limit lead exposure for children 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.

There has been an increase in the number of firms certified to perform regulated lead work in Minnesota. This is due in large part to increasing requirements by HUD to perform residential rehabilitation work in a lead safe manner. The number of residential lead hazard reduction notices submitted to MDH has not correspondingly increased as a result. The main reason for this is the ability of housing programs to classify work according to intent of the original project. As a result, a large number of residential rehabilitation projects are being done as renovation work and not regulated lead work, however, they are being performed with ever increasing lead safe work practices. This lack of regulated activity has served to limit the number of compliance inspections done by MDH.

*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 the legislature, 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 the lead compliance program are making sure that potential sources of lead exposure in the environment of 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 sources of lead exposure in the environment of persons with elevated BLLs.

Table 6 reflects the number of licenses issued by MDH for 2002. The number of certified firms represents a significant increase over the 54 reported for 2000.

**Table 6: Total number of licenses issued across Minnesota as of December, 2002.**

<b><u>License issued</u></b>	<b><u>Total in MN</u></b>
Certified firm	124
Inspector	2
Project Designer	24
Risk Assessor	170
Supervisor	223
Worker	112

The limited number of individuals currently licensed to perform lead hazard reduction work in Minnesota face a potentially heavy work load. Both high-risk housing and persons licensed to do lead abatement work tend to be concentrated in the Twin City metro area and Duluth. The relative shortage of licensed lead hazard reduction professionals in greater Minnesota continues to present a challenge, both for public health agencies and families at risk for lead exposure.

Since this report was generated in 2000, the number of firms and individuals licensed to perform lead hazard reduction work has increased by at least four times. HUD regulations have had the greatest impact on the number of firms and individuals trained to perform lead hazard reduction work. However, the greatest shortage of properly trained individuals in any discipline continues to be in greater Minnesota. MDH will continue to encourage other state agencies and resources in greater Minnesota to develop capacity to address lead hazard reduction needs.

### *B. Special Projects*

MDH sought to continue to improve the capacity of its lead compliance program through an EPA Special Projects for Compliance Assistance Grant. This grant is supplementary to current state and other federal lead funding with regard to statewide lead program activities, including compliance assistance, compliance monitoring, and enforcement. The goals of this grant are to provide the following support for the lead compliance program:

- Develop an interactive database with online access by certified firms, training course providers, and licensed individuals who perform regulated lead work. This system will create an access point for the submission of notice and reports forms by individuals or entities with internet capability. The system can also be used by individuals to obtain lists of certified firms or licensed individuals who perform regulated lead work, and training course information. To look up the nearest licensed lead professional, see the MDH website at: <http://www.health.state.mn.us/divs/eh/lead/prof/database.cfm>.
- MDH is responsible for administering independent examinations for licensed disciplines throughout Minnesota. The current format for each independent exam contains questions which apply only to Federal OSHA regulations, EPA regulations, and the 1997 HUD Guidelines. MDH staff are developing and updating examination questions specific to Minnesota regulations for the inspector, risk assessor, and supervisor examinations.
- Provide funding to Sustainable Resource Center (SRC) which is a nonprofit organization that conducts housing rehabilitation work and lead education and cleanup work in Minnesota. SRC has created an interactive educational outreach production. This production is the theatrical play "Jimmy's Getting Better". The play depicts families living with the consequences of lead poisoning, and presents the simple steps that parents can take to keep their children safe.
- Purchase field computer equipment to assist staff in conducting compliance activities.

MDH lead program staff have begun development of environmental case management guidelines to assist other assessing agencies deal with elevated blood lead cases. These guidelines will



assist both MDH and other assessing agencies in establishing consistent approaches and goals for completing lead risk assessments and environmental case closure. An environmental case closure occurs when all lead hazard reduction orders are completed and a clearance inspection demonstrates no deteriorated lead paint, bare soil, or lead dust levels that exceed the state standards (Minnesota Statutes 144.9504).

MDH has continued to expand Minnesota's lead program activities by working towards the development of a program pursuant to Section 406(b) under Title IV of the Toxic Substances Control Act (TSCA). This grant activity is also supplementary to current state and other federal lead funding with regard to statewide lead program activities, including compliance assistance, compliance monitoring, and enforcement. The goals of this grant are to provide the following support for the lead compliance program:

- Offer Pre-Renovation Education Rule assistance training and presentations to educate Minnesota's renovation industry and property management firms about the federal requirements pertaining to disclosure of lead-based paint hazards before starting renovation activities. MDH will also work closely with various housing programs in Minnesota (e.g., Minnesota Housing and Finance Agency) in order to ensure that notices are provided before renovation on HUD-related projects. Make available a downloadable copy of the disclosure pamphlet along with related disclosure forms at the MDH lead program website; [www.health.state.mn.us](http://www.health.state.mn.us).
- Develop and publish a newsletter for certified lead firms, licensed lead disciplines, general building contractors/operative builders (licensed by the Minnesota Department of Commerce), special trade contractors, commercial building trades people, property management firms of multi-family housing, landlords, and interested parties.
- Work towards the development of revised state regulations and a plan for attaining State lead program authorization by EPA, according to federal requirements that lead to the administration and enforcement of the Pre-Renovation Education Rule (Section 406b).

### *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 LHR training in Minnesota (see website at: [www.health.state.mn.us/divs/eh/lead/prof/trainers.htm](http://www.health.state.mn.us/divs/eh/lead/prof/trainers.htm)). Providers must furnish documentation that they employ a training manager and a principle training instructor for each of the courses they offer. Both the training manager and the instructor must meet experience, training and education requirements established in Minnesota Rules, part 4761.1050, subpart 5. The MDH lead compliance staff regularly review the training course content and ensure that it contains all the required topics.

### *D. Legislative Activities*

The lead statute was successfully updated in the 2001 legislative session based on experience in the program since it was first passed in 1995. Primarily there were technical changes and

updating of language, plus the need for more community outreach. The desired outcome was to provide education and allow intervention at a stage earlier than finding an elevated blood lead, requiring immediate intervention.

Minnesota Statutes, section 144.9508, requires the Department to adopt rules that:

- establish procedures for lead hazard identification;
- establish lead abatement and lead hazard reduction methods;
- set standards for lead in paint, dust, bare soil, and drinking water; and
- establish criteria for the licensure, registration and training of the lead disciplines and the certification of lead contracting firms.

The rules governing lead work in Minnesota are currently being revised to reflect changes from the 2001 legislative session. The main focus of the amendments will be standards for lead content of dust on floor surfaces and window troughs and establishing training criteria for interim control workers and lead sampling technicians. The Department is also amending the rules to:

- ensure they conform with federal regulations adopted since the current state rules were adopted. The Environmental Protection Agency (EPA) has lowered the lead content standard for dust on floor surfaces and window troughs. The Department will amend its dust standards to equal EPA's standards for these surfaces,
- make technical changes for clarification purposes,
- establish rules for training requirements and registration of lead sampling technicians,
- establish the training content and length of the training course for the interim control worker,
- amend the notification requirements for lead hazard reduction work; and
- make changes to the lead hazard reduction methods for interior small and large areas, exterior painted surfaces, and soil.

The amendment to the rules would likely affect local housing authorities; licensed lead workers, supervisors, inspectors, risk assessors and project designers; certified lead firms; lead training course providers; and those performing interim control work and lead sampling technician services. Interested persons or groups have submitted written comments or information on the current and proposed rules which have been incorporated into the proposed rules. The Department has scheduled to hold public meetings in early 2003 to discuss the proposed rules and receive additional comments. The Department has also formed an advisory committee to discuss the rule changes more formally, if necessary.

The legislature recently established an annual 5% withhold from contracts between health plans in Minnesota and the Department of Human Services (DHS). Specific targets for increasing lead screening in high risk populations are a significant part of the measures used to determine the amount of the withhold that may be "earned" back by the plans. MDH staff collaborated with numerous partners in this effort to help raise awareness of lead screening needs by providing data, background, and recommendations. It is hoped that this effort, in combination with a \$30 incentive payment to plans for lead tests performed above previous rates (implemented by DHS in collaboration with MDH), will help get all at-risk children screened for lead.

### *E. MDH Compliance Inspections*

Minnesota statute defines the regulatory authority of MDH regarding work impacting lead painted surfaces. Lead hazard reduction projects that are regulated by MDH (interim control and abatement) require a notice to MDH before work can start. As a result of legislative changes in 2001, MDH no longer receives notifications for lead inspections and lead risk assessments. However, these activities must still comply with state regulations.

MDH monitors both firms and individuals employed by firms performing 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) through both notices and inspections (Table 7). Non-compliance is managed consistent with the Health Enforcement Consolidation Act (MS 144.989 to 144.993). All non-complying cases have been resolved. MDH also provides technical assistance to the regulated community through information on lead hazard reduction and compliance issues observed during field audits

**Table 7: Number of notifications received and inspections performed by MDH from January 2001 to December 2002.**

<b>Activity</b>	<b>2001*</b>	<b>2002</b>	<b>Total for period</b>
<b># Notices</b>	394	245	639
<b># Inspections</b>	85	72	157
<b># Non-Compliance</b>	4	3	7

\*Higher values for 2001 include notices and audits of Risk Assessments exempted through a legislative change in notification requirements on August 1, 2001

### **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 to 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 Week and federal requirements for home sellers and to disclose information about lead hazards.

#### *A. Networking:*

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

The MDH Lead Program attends interagency meetings that conduct studies of statewide data needs and proposed solutions. In Minnesota, we have been funded through CDC to develop an

integrated approach for data collection through a program called the National Electronic Disease Surveillance System (NEDSS). The Minnesota NEDSS system is currently used to securely transfer electronic laboratory data to state agency databases, including the MDH lead program.

Since 1995 MDH has been regularly convening meetings to promote collaboration between diverse agencies addressing lead poisoning. The “Interagency Lead Collaborative” was examined in 2001 using a formal evaluation process and found to no longer be meeting participants needs. It had become too large for CDC grantees to effectively address grant business, but too small to be truly representative of all interested parties. Based on feedback from the group and the evaluation, starting in 2002 MDH convened a new networking group for diverse agencies involved in addressing lead poisoning in Minnesota called Minnesota Collaborative Lead Education and Assessment Network (M-CLEAN). This group includes representatives from major urban (Twin Cities and Duluth), suburban (Hennepin and Ramsey Counties), and rural areas (CHS agencies from various counties). Other members work with professional (MN Visiting Nurses Association and MN Environmental Contractors Association) and community organizations (Sustainable Resources Corporation and MN Day Care Association). A wide assortment of Minnesota state agencies (Department of Human Services and Minnesota Housing Finance Agency) and federal agencies (US Department of Housing and Urban Development and US Environmental Protection Agency) are also members of M-CLEAN. This group meets every 6 months to share information, form collaborations, and learn about current lead issues.

Several staff from MDH assisted the City of Minneapolis in the creation of their lead network. Although the network was started in 1999, work continued in the current period through collaboration and subcommittee meetings. The primary goal of the network is to have lead-safe children throughout Minnesota by increasing the availability of lead-safe housing.

One of the major partners of the MDH Lead Program is the Minneapolis-based Sustainable Resources Center (SRC) The SRC also operates the CLEARCorps (Community Lead Education and Reduction Corps; a federally funded “Ameri-Corps” organization) effort for Minnesota. SRC/CLEARCorps is currently contracted to do outreach services to rural areas and also to the Somali population. Rural outreach on lead education utilizes SRC/CLEARCorps 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. The CLEARCorp segment of the non-profit is equipped to help with primary prevention activities through lead hazard education and remediation activities.

#### *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.

An article was published in the October 2002 edition of the journal *Minnesota Medicine* (85(10):44-49) describing the MDH lead guidelines and encouraging physicians to remain vigilant to addressing possible lead exposure in their practices. The article may be viewed online at: [www.MMAonline.net](http://www.MMAonline.net). and is presented in Appendix 3.

Press contacts, including Govesan Paints, lead in children's jewelry, lead in Christmas decorations and lighting, development of information for firing ranges, and several general background information requests were handled consistent with MDH guidelines.

Staff responded promptly to all legislative contacts, including testifying before Children's Environmental Health group, collaborating on development of 5% withhold, implementation of \$30 reimbursement incentive, and clarifying reporting times for required lead tests as part of well-child checkups.

#### *C. Internet Resources:*

The Lead Program also 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)). It 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), a downloadable version of a lead education workshop, and links to many external lead resources.

The Lead Program web-page shows how to sign up for an Email lead list serve that serves as a statewide clearinghouse for lead questions and information to local public health and private partners. This listserv location offers participants the ability to post information and discuss relevant issues about lead poisoning prevention within the state. MDH also posts relevant information to the discussion group and encourages other state groups or individuals to post and respond to information.

The Lead Program maintains a quarterly newsletter sent to regulated parties and local public health (<http://www.health.state.mn.us/divs/eh/lead/newsletters/index.html>).

#### *D. Promoting lead awareness:*

Efforts to raise awareness of lead poisoning have included national "Lead Poisoning Prevention Week," which was held October 21 – 27, 2002. This time period was designated by key federal agencies that work most directly to prevent lead poisoning: the U.S. Centers for Disease Control and Prevention (CDC); the U.S. Environmental Protection Agency (EPA); and the U.S. Department of Housing and Urban Development (HUD). According to the CDC, the goal of National Lead Poisoning Prevention Week is twofold: (1) to raise awareness about this serious health issue and the importance of screening at-risk children at ages 1 and 2 years and children

36-72 months who have not been previously screened, and (2) to urge people to take precautions to minimize exposure to lead.

To support this national effort, the Minnesota Commissioner of Health proclaimed the week of October 21st (October 21 – 27, 2002) “Minnesota Lead Poisoning Prevention Week” (see Appendix 1). In Minnesota, the week offered an opportunity for state and local public health agencies and their private partners to call childhood lead poisoning prevention into the spotlight, and raise awareness about the sources and solutions of childhood lead poisoning. An information packet was sent out to clinic administrators, CHS administrators and PHN directors, and new physicians. The packets included the following materials: Lead Week Proclamation, Blood Lead Screening Guidelines for Minnesota, Childhood Blood Lead Clinical Treatment Guidelines for Minnesota, Routine and Periodic Blood Lead Screening Risk Questionnaires. The information was targeted very effectively, with 100% of the packets successfully being delivered to the CHS administrators and PHN directors (groups we work with frequently), and over 95% of packets successfully reaching Clinic administrators (only 67 returned of 1058 sent) and new physicians (only 39 returned of 730 sent).

The Federal Requirements also promote awareness among homeowners and renters before they move into a new home. EPA and HUD both require sellers and leasers of most pre-1978 housing to disclose the presence of known lead hazards, including lead-based paint. Sellers and leasers must also provide purchasers and lessees with any available records or reports with relevant information about such hazards. They must provide purchasers and lessees with the federally approved pamphlet “Protect Your Family From Lead In Your Home.” Lastly, 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.

Contractors are also required by federal agencies to provide the property owner with “Protect Your Family From Lead In Your Home” when doing renovation work in any pre-1978 housing. The pamphlet describes the potential lead-based paint hazards that may be created when doing renovation work. The property owner may then clean the property properly after the renovation work is completed, to ensure that no lead-based paint hazards are present when the property is re-occupied.

### **Policy Planning and Program Evaluation**

During Fall 2001, the MDH mailed a survey to approximately 3,000 Minnesota family physicians and pediatricians to determine if:

- They received a copy of the childhood Blood Lead Screening Guidelines for Minnesota sent to them via a mass-mailing in March 2000; and
- They had changed their childhood blood lead screening practices as a result of receiving the Blood Lead Screening Guidelines.

Of the 2,457 deliverable surveys, 1,288 (52 %) were returned to MDH. Of this group, 78 % stated that they remembered receiving the Blood Lead Screening Guidelines mailing. Nineteen

percent of the group who remembered receiving the Blood Lead Screening Guidelines mailing increased their blood lead screening following the receipt of the guidelines. The general conclusions we can draw from the survey results include:

- The mailed survey strategy was an effective way to collect information from a large group of Minnesota physicians;
- The mass mailing was a reasonable strategy for reaching Minnesota physicians with public health (lead poisoning prevention) information; and
- The mass mailing strategy was a reasonable strategy, when combined with other communication strategies, to raise physician awareness and influence blood lead testing practices in Minnesota.

An evaluation of the initial M-CLEAN meeting was sent out in late 2002. Responses indicated that the meeting was a very positive experience and that it would help them better connect with other agencies involved with lead poisoning prevention. The ability to gather during an extended break between meeting sections was especially valuable. Having light snacks available was emphasized as promoting both attendance and interaction during the break. The next meeting will focus on housing issues and hazard reduction methods, and will attempt to better forge bonds between public health and housing agencies.

In May 2002, the MDH Lead Program met to discuss:

- the program's capacity as a comprehensive state program for lead poisoning prevention,
- how the program can address the national 2010 goal to eliminate childhood lead poisoning.

The criteria for a comprehensive state program for childhood lead poisoning prevention were found in the 1994 document "Lead Poisoning Prevention: A Guide for Legislators" authored by the National Conference of State Legislatures and the U.S. Environmental Protection Agency. The authors noted that these criteria, or elements, *generally* include the assurance of: surveillance; screening; reporting; public outreach; case management; environmental assessments; and lead hazard remediation and disclosure activities. The MDH Lead Program currently addresses all elements of a comprehensive state lead program. In addition to having sufficient legislative and staffing capacity to undertake program activities, staff meet at regular intervals to assess service gaps and plan for ongoing activities. This 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.

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 cases where the reported BLL is 10 µg/dL or greater. Each record is then reviewed for accuracy a second time, by a different member of the program staff before being entered into the permanent database. The completeness of the reporting data and the timeliness with which it is entered in the database are reviewed periodically. 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. Additionally, analyzing labs are encouraged to send their information electronically. This reduces data entry errors and the time required for the data entry process.

## Funding Status

State lead 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 \$273,000 annually to the program. These funds are used to help meet MDH statutory obligations and are a critical source of "matching" funds for federal grant applications. An annual safe housing grant totaling \$25,000 was available through 2002 from this source to local public health agencies. These grants are used to provide lead safe housing to families whose homes are undergoing potentially hazardous lead work.

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 seven years from CDC to implement a CLPPP program. In FY01, MDH received \$743,057, and in FY02 received \$755,538. The eighth application will be submitted in March/April 2003. Part of each CDC grant is "passed through" to local public health agencies to help increase capacity to offer lead poisoning prevention services. 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 is put at risk every 3-5 years via a competitive grant application.

MDH has received Lead Cooperative Agreement and Enforcement grants from the U.S. EPA since 1994. The funding amount has averaged about \$250,000 per year. This funding has provided ongoing develop 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 activities. MDH was informed in October 2002 that EPA would be reducing lead grants available to states in Region V by about 10% to 20% starting in October 2003.

MDH was awarded a Special Projects Grant for Lead Compliance Assistance in the amount of \$107,912 in September 2001. The two-year grant is being used to develop an interactive website database for regulated parties and the general public, revision of the independent examinations for licensed disciplines, sponsorship of a dramatic play about lead poisoning, and purchase of a laptop computer for MDH compliance staff.

MDH was awarded an EPA grant in the amount of \$111,835 in October 2002. This three-year grant will further expand Minnesota's lead program activities by working towards the development of a program pursuant to Section 406(b) under Title IV of the Toxic Substances Control Act (TSCA) or the Pre-Renovation Education Rule which is overseen by the EPA. This requires that residential renovation contractors provide occupants of units they are to work on with an informational pamphlet prior to starting the work.

The State Government Special Revenue Fund fee account has a flat revenue stream of about \$20,000 per year generated from accreditation and training permit fees. MDH regulates about 125 certified firms and 575 licensed individuals. A small number of lead professionals are employed by local government and are exempt from credentialing fees. MDH is also unable to charge a fee for the independent exams provided to individuals wanting a license as a lead inspector, risk assessor, worker, supervisor and project designer.



The U.S. National Institutes of Safety and Health (NIOSH) has a purchase order agreement with MDH for approximately \$24,500 for quarterly 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 elevated BLLs, and (3) prevent “take home lead” to children.

The environmental health trends identified by 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 general funds for these activities.

### **Future Directions**

Future directions for the Minnesota Department of Health are largely determined by the requirements of funding sources. CDC, which funds the Minnesota Childhood Lead Poisoning Prevention Program (MNCLPPP), 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 6 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.

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 gauge testing rates for the young Medicaid population in Minnesota.

CDC is also encouraging participation in their High Intensity Screening (HITS) project. This allows the determination of prevalence and incidence of childhood blood lead poisoning in highly populated high-risk/multiple-risk areas. MDH is currently conducting meetings for a HITS project with the city of Minneapolis. These meetings are expected to result in a grant application to CDC.

As funding allows, MDH is continuing work with the Women, Infants, and Children (WIC) program to assess and remove barriers to screening for lead poisoning at WIC clinics. This high-risk population receives other types of screening which make WIC a likely group for MDH lead program to network with. Currently, cost issues are hindering closer collaboration with WIC. However, the Countryside lead study demonstrated that productive collaboration is possible between lead and WIC with respect to lead screening efforts.

Increasing compliance monitoring and enforcement of lead paint regulations continues to be a priority for both state efforts and requirements as part of federal grant funding provided by US EPA. Additional lead compliance capacity will be pursued through an application to HUD for

lead hazard control projects in collaboration with the Minnesota Department of Trade and Economic Development and the Minnesota Housing Finance Agency.

Program staff are actively participating in activities to improve the recording and transfer of lead test data. Most large labs 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. However, strict compliance with all data privacy limitations is also crucial. To complement the future system of data transfer, MDH is currently involved in Beta testing an Oracle database, which will replace the current Blood Lead database.

In May 2003 MDH will present State Lead Regional Case Management seminars in St. Cloud, Mankato, Bemidji, and in Duluth. This will provide an opportunity to meet regional lead staff, present information on lead issues (the primary focus will be on the case management guidelines and their implementation at the local level), and get feedback on state-wide needs and concerns.

### **Conclusions**

Lead is a major, preventable pediatric environmental health risk. Children are particularly at risk from exposure to lead, with blood lead levels above 10 µg/dL considered elevated. Although lead is found throughout the environment, the major exposure pathway of public health concern is through deteriorated, lead-based paint.

The MDH blood lead surveillance database collects blood lead reports on all Minnesota residents. New state guidelines will 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.

As an interdisciplinary program, the lead staff are required to generate unique and innovative approaches to institutional and scientific problems. These include forming cooperative workgroups to solicit input prior to generating guidelines, cooperating with other agencies to meet common goals, conducting research to address basic problems, and overseeing lead hazard reduction efforts to ensure complete and timely resolution of lead orders. This spirit of creativity and risk-taking is fostered, resulting in a program that is flexible, responsive, and well-grounded in the core public health functions of assessment, assurance, and policy/planning.

## **Appendices**

**Appendix 1: Proclamation declaring October 21-27, 2002 as Minnesota Childhood Lead Poisoning Prevention Week**

**Appendix 2: Maps showing locations of family practice physicians and pediatricians in Hennepin County**

**Appendix 3: *Minnesota Medicine* article: Minnesota Childhood Blood Lead Guidelines**

# **Appendix 1**

**Proclamation declaring October 21-27, 2002 as  
Minnesota Childhood Lead Poisoning Prevention Week**



# *Proclamation*

**Minnesota Department of Health  
October 1, 2002**

- Whereas, lead poisoning is one of the most significant environmentally-related health problems facing our children, here in Minnesota and nationwide; and
- Whereas, one of the primary sources of lead exposure for children is lead-based paint, which can be found on interior and exterior surfaces in an estimated 1.4 million older homes across Minnesota; and
- Whereas, even at relatively low levels, lead poisoning can slow a child's growth, damage hearing, cause behavior problems, and make it harder to concentrate or do well in school, and these relatively subtle health problems may not be readily apparent unless a child is appropriately screened for possible lead poisoning; and
- Whereas, in 2001, test results revealed that approximately 2,000 Minnesota children under the age of six had enough lead in their blood to harm them, and many at-risk children were never even tested; and
- Whereas, appropriate identification and care of children with elevated lead levels is essential if we are to ensure that the devastating effects of lead exposure are minimized, MDH encourages the use of recently developed Minnesota guidelines for screening, case management, and clinical treatment; and
- Whereas, increased awareness of childhood lead poisoning is critically important, so that parents and health care providers can work to avoid exposure to lead in the environment, thereby preventing the destructive effects of this illness;

Now, therefore, I, Jan K. Malcolm, Commissioner of Health, do hereby declare the week of October 21-27, 2002, to be **Minnesota Childhood Lead Poisoning Prevention Week** throughout the State of Minnesota.

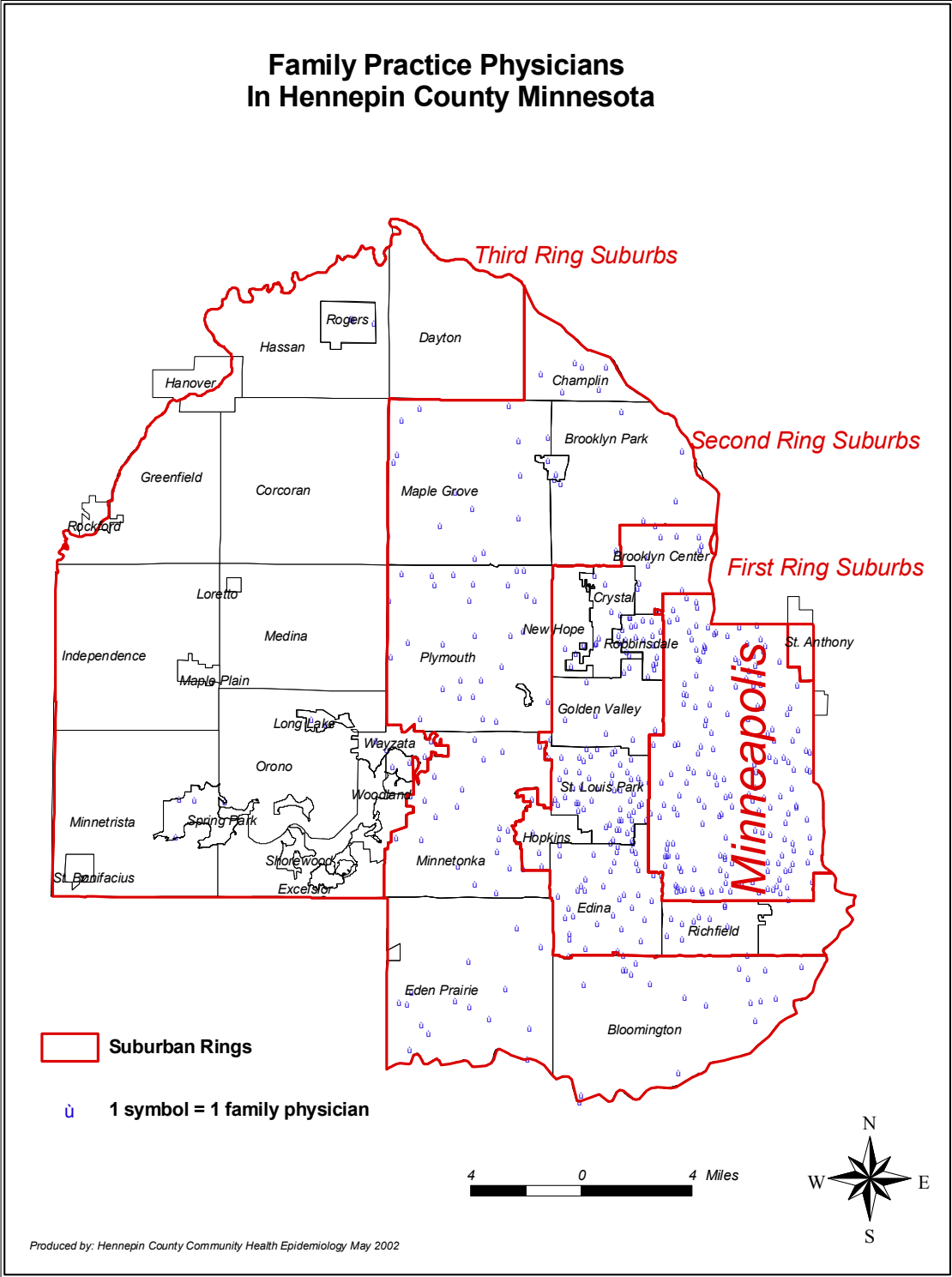


Jan K. Malcolm  
Commissioner of Health  
October 1, 2002

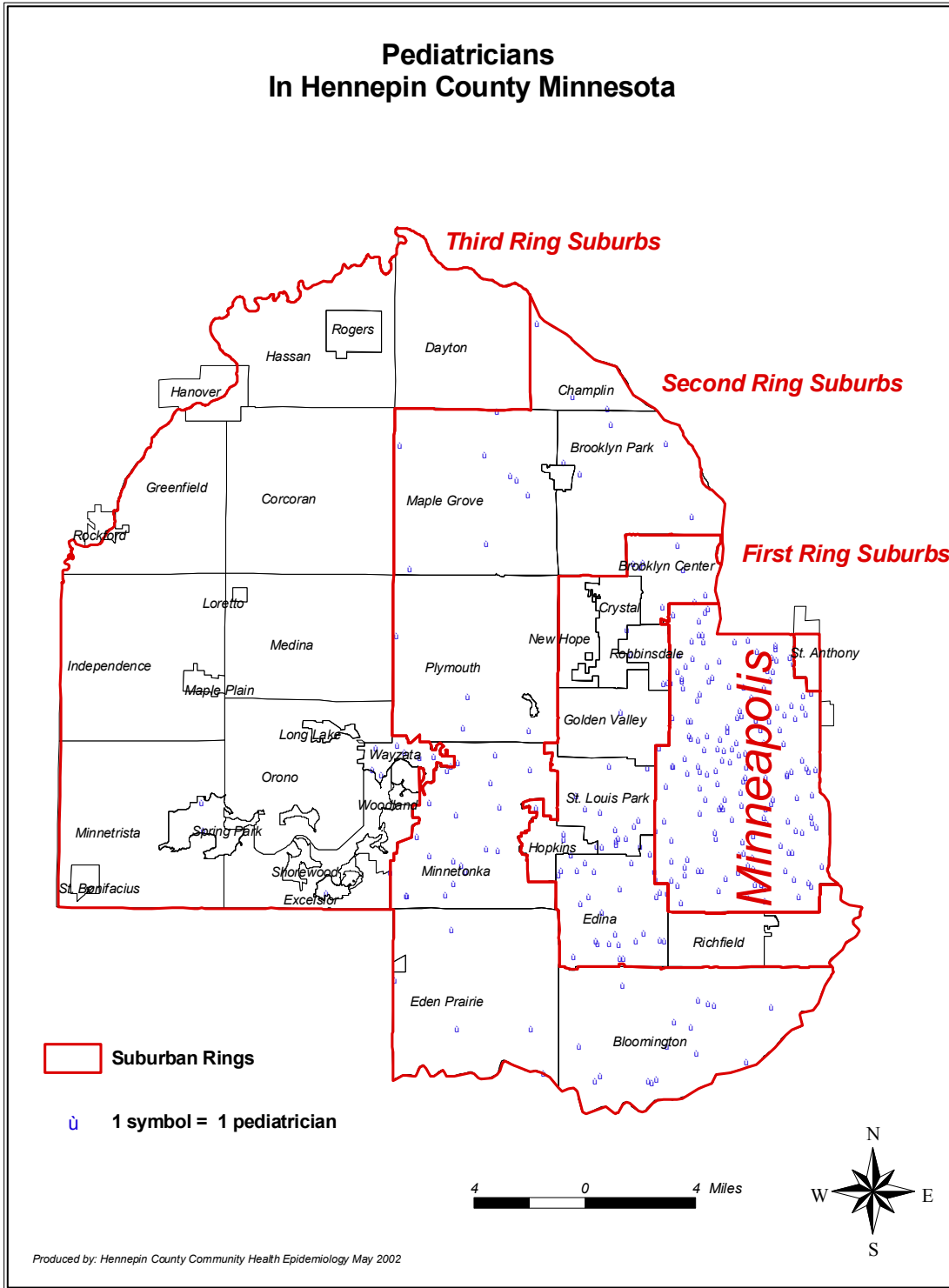
## **Appendix 2**

### **Maps showing locations of family practice physicians and pediatricians in Hennepin County**

# Family Practice Physicians In Hennepin County Minnesota



# Pediatricians In Hennepin County Minnesota





## **Appendix 3**

### ***Minnesota Medicine* article: Minnesota Childhood Blood Lead Guidelines**

# Minnesota Medicine

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## Minnesota Childhood Blood Lead Guidelines

*Children with the greatest risk factors for lead poisoning are being targeted for screening and treatment.*

by Daniel Symonik, Ph.D., Becky Bernauer, and Myron Falken, Ph.D., M.P.H.

### ABSTRACT

**Lead poisoning continues to pose a major environmental health threat to Minnesota's children. Currently, about 2,000 children a year in Minnesota are identified as having elevated blood lead (greater than 10 µg/dL). The Minnesota Department of Health has developed statewide guidelines for screening, case management, and clinical treatment of children who have been exposed to lead. The screening guidelines target children with the highest risk of exposure. The case management guidelines provide information to public health agencies on recommended steps for dealing with an elevated blood lead case. The clinical treatment guidelines assist physicians and other health care professionals with the medical aspects of a lead case. These guidelines are based on state data, were developed using diverse work groups, and have been endorsed by the medical community. They provide Minnesota-specific guidance on how to best identify and treat a child exposed to lead and to minimize exposure.**

### The Public Health Problem

Childhood lead poisoning is a major, preventable environmental health problem in the United States and in Minnesota. Although Minnesota has made progress recently on this issue, currently, about 2,000 children a year in Minnesota are identified as having elevated blood lead (10 µg/dL or greater) ([see Figure 1](#)). The Minnesota Department of Health (MDH) believes that figure may not reflect the full extent of the problem. Many children with lead poisoning aren't being identified and treated, and many physicians and local public health agencies often have little or no experience in treating and managing a child with elevated blood lead.

Until the early 1970s, the acceptable level of lead in blood was 60 µg/dL in children. Early in 1990, after a series of intermediate decreases of acceptable blood lead levels, the Centers for Disease Control and Prevention (CDC) lowered the acceptable level to 10 µg/dL. The CDC estimated that nationally, for the period 1991-1994, about 4.4% of children younger than the age of 6 had blood lead levels greater than or equal to 10 µg/dL.<sup>1</sup> This corresponds to roughly 890,000 children.

The symptoms of severe lead poisoning are often obvious: At extremely high levels, lead

poisoning can cause seizures, comas, and even death in children.<sup>2</sup> But even low concentrations of lead in the blood can cause symptoms such as reduced IQ, shortened attention span, problems with reading and learning, hyperactivity, and behavior problems. Because these symptoms may indicate many different childhood ailments and may not be recognized as signs of lead poisoning, it is important to screen children who may be at an increased risk of lead exposure.

Previously identified risk factors for childhood lead exposure include<sup>1-4</sup>

- Age (from 6 months to 72 months, children have a rapidly developing nervous system);
- Low income (associated with poor housing, diet, health care, and education);
- Poor nutrition (iron and calcium deficiencies as well as dietary fat increase lead absorption);
- Urban residence (more sources of lead);
- Recent or ongoing home remodeling in pre-1978 housing (increases dust and flaking paint);
- and
- Recent immigration (immigrant children may have been exposed in their home countries).

### **Minnesota's Response**

In 1991 the U.S. Department of Health and Human Services called for a strategic, coordinated, societywide effort to eliminate lead poisoning in children.<sup>5</sup> This effort emphasized primary prevention and coordination between pediatric health care providers and public agencies. The target year of 2010 was established for the “elimination of lead poisoning in the United States.”<sup>6</sup> In 1997 the CDC issued guidance to help states determine the best screening approach for their area, essentially recommending targeted rather than universal screening.<sup>7</sup> In response, the MDH organized a series of work groups, consisting of professionals from a variety of fields, to develop guidelines for screening, case management, and clinical treatment of children who have been exposed to lead.<sup>8</sup> These guidelines have been endorsed by the Minnesota Medical Association (MMA), the Minnesota Chapter of the American Academy of Pediatrics (AAP), and the Minnesota Academy of Family Physicians (MAFP), as well as by other health care professional organizations.

The Blood Lead Screening Guidelines for Minnesota (see p. 47), officially released in March 2000, recommend that physicians order blood tests for children residing in specific geographic areas that have a high rate of elevated blood lead cases (Minneapolis and St. Paul) and children matching specific demographic groups that have a high rate of elevated blood lead (eg, Medicaid recipients, immigrants, refugees). In addition, the guidelines include a personal risk questionnaire that should be administered to all other children to determine if they are being exposed to lead and should be tested.

The Childhood Blood Lead Case Management Guidelines for Minnesota, officially released in June 2001, include recommendations for the case manager, protocols for the home visit, a list of referrals for services and information, action plans for various blood lead levels, a review of case closure thresholds, and a glossary of commonly used lead terms. These guidelines are intended to help build the capacity for providing lead services in each agency that conducts home visits with families affected by lead.

The Childhood Blood Lead Clinical Treatment Guidelines for Minnesota, officially released in

July 2001, were created to assist physicians—some of whom may have little or no experience with lead-exposed patients—in providing appropriate, consistent, and adequate care for lead-exposed patients who have elevated blood lead levels. The underlying message of the guidelines is that lead is a significant environmental health problem even at low levels of exposure for children and pregnant women and at high levels of exposure for adults. Making sure that the child's environment is and remains lead-safe is an essential part of caring for a child with elevated lead levels. Providing a lead-safe environment for the lead-exposed child is a joint responsibility, involving the public health nurse, the lead risk assessor, and the child's physician.

### **Identifying Minnesotans at Risk**

The MDH maintains an extensive blood lead surveillance system for the purpose of monitoring trends in blood lead levels in adults and children in Minnesota. As of January 1, 2002, the database contained 432,013 records of blood lead test results from 292,044 individual Minnesota residents dating back to 1995. The data are used to help identify populations at risk for elevated blood lead levels and to help ensure that screening services are provided to groups with the highest risk of lead poisoning and that environmental and medical follow-up is provided to children with elevated blood lead levels.

In general, the MDH Lead Program responds to blood lead reports in the following manner:

- If levels are less than 10 µg/dL, information is entered into the surveillance database, and no additional follow-up is pursued.
- If levels are 10 µg/dL or greater, educational intervention is called for. This includes giving the children's caretakers a letter and information on how to reduce and/or avoid exposure to lead in the environment.
- If levels are 20 µg/dL or greater (or 15 µg/dL for more than 90 days), environmental follow-up is necessary. This includes assessment of walls, windows, etc.; abatement or hazard reduction; and follow-up sampling.
- Levels of 60 µg/dL or greater indicate a medical emergency, and immediate action is taken.

Although Minnesota has mandatory reporting from all facilities analyzing blood lead levels, blood lead testing is not universal, and the data collected by the surveillance system are not representative of all Minnesota children. Data are collected only when a family member or health care provider orders a blood lead test. The percentage of children tested varies greatly from county to county (eg, in 1998 it ranged between 0.6% and 15%) and from year to year. Based on 1998 data, 77% of the children in the Minnesota blood lead surveillance database reside in urban areas.<sup>3</sup> Therefore, there is fairly reliable information on the prevalence of lead poisoning in urban areas of Minnesota but insufficient information on the prevalence in rural areas and for the state overall. Evidence shows, however, that some populations are clearly at risk. For example, Medicaid enrollees accounted for 83% of U.S. children aged 1 to 5 years who had blood lead levels >20 µg/dL, according to a 1991-1994 study.<sup>4</sup> Despite longstanding requirements for blood lead screening in the Medicaid program, an estimated 81% of young children enrolled in Medicaid nationally had not been screened for blood lead.<sup>9</sup> Minnesota shows a similar trend; 70% of the Medicaid-eligible population did not receive a blood lead test in 1998.<sup>10</sup>

## Blood Lead Trends

The number of Minnesota children tested for lead has been steadily increasing since 1998 ([see Figure 2](#)). This increase may be due, in part, to the efforts of the MDH and other organizations that have worked to raise awareness of childhood lead poisoning; the development of the statewide screening, case management, and clinical treatment guidelines; and the increased recognition by physicians that lead remains a significant environmental health threat. The decline noted in 1998 may be partially the result of the CDC changing its recommendation for universal screening to targeted screening in 1997. As high-risk populations were better defined, the benefits of lead testing became more widely understood, and educational efforts matured, the screening rate recovered from 1999 onward. The percentage of Minnesota children receiving a lead test in a year has consistently been just under 10% of the total number of children in Minnesota younger than 6 years old in any year, which translates into about 390,000 children. However, not all Minnesota children have a high risk for lead exposure. Because not all Minnesota children are exposed to lead risk factors, the optimal level of screening, as a percent of the total population of children, will be less than 100%.

The general downward trend in the number of elevated blood lead cases is consistent with national trends but should not be used to conclude that lead is no longer a significant public health threat in Minnesota. The slight increase for 2001 may be the result of increased physician awareness of risk factors leading to more effective screening. Results are also shown for cases greater than 20 µg/dL, which is the level above which an environmental assessment is required to identify and mitigate lead exposure. Approximately 85% of the reports above 20 µg/dL in Minnesota come from just 2 counties (Hennepin and Ramsey), indicating that in specific areas of the state lead poisoning continues to be a major public health problem. For this reason, the MDH screening guidelines recommend universal testing in Minneapolis and St. Paul.

While the rate of lead screening increased during the 1999-2001 period, the number of actionable (blood lead >20 µg/dL) lead cases stayed relatively constant. Although this data is difficult to interpret, this lack of an increase may be due to difficulty in reaching the highest-risk populations. It also may indicate that the amount of lead exposure is becoming relatively constant in Minnesota. Regardless, it is safe to conclude that the average blood lead level in Minnesota and nationally has declined dramatically from its historic high and declined significantly over the past 5 years.

The Government Accounting Office (GAO) found that three-fourths of all children aged 1 through 5 who had an elevated blood lead level were enrolled in Medicaid or the Supplemental Food Program for Women, Infants, and Children (WIC).<sup>11</sup> The federal program that establishes blood lead testing requirements for the Medical Assistance population is the Child and Teen Checkup (CTC) program in Minnesota. This program stipulates blood lead testing at ages 1 and 2 as part of a wide range of health care services. In Minnesota, more than 9% of children receiving Medicaid services had harmful levels of blood lead, which was double the rate of elevated blood lead levels in children not in these federal programs.<sup>10</sup>

The MDH collects demographic data on all refugees entering the state. In 1997, 260 (64%) of the 407 refugee children younger than the age of 6 received a lead test. Of these, 72 (28%) had an elevated blood lead level of 10 µg/dL or greater. These numbers improved somewhat in 1998 with 455 (69%) of the 662 refugee children receiving lead testing. Twenty percent of

these children had elevated blood lead levels. The refugee children comprise a wide range of ethnic origins ([see Table](#)).

The 1998 data show an increase in the testing of some ethnic groups that had low levels of testing in 1997. The number of children from the former Yugoslavia appearing in the blood lead database increased from 37% of these children in 1997 to 64% in 1998. The number of children from Africa (other than Somalia) tripled in the most recent refugee database, and the percent of those children found in the blood lead database increased from 60% to 81%.

### **Next Steps**

The MDH is implementing a blood lead study in rural Minnesota that will help determine the extent of risk for rural children. All children ages 6 months through 3 years in a 3-county area in west-central Minnesota will have their blood lead levels tested. A risk assessment questionnaire will also be filled out for each child. The survey responses in the cases of children who have elevated blood lead levels will help determine if the questionnaire that is administered as part of the Minnesota screening guidelines appropriately triggers blood level tests. This study is being done in collaboration with the Countryside Public Health Department and the CDC and should be completed in mid-2003.

The MDH recently conducted an evaluation of the implementation strategy for the Blood Lead Screening Guidelines for Minnesota. A survey was sent to 2,700 physicians to determine if they actually received the guidelines, if the guidelines were viewed by the health care community as a positive change, and if the guidelines are currently being used throughout Minnesota. In general, it was found that the majority of the respondents had received the guidelines via the initial mailing and about 20% of them had increased blood lead screening as a result. The MDH will continue to evaluate all of the guidelines and provide information to physicians, public health agencies, and health care providers on targeted screening, treatment, and case management for elevated blood lead. The MDH Lead Program public health nurse is currently working with local public health agencies to implement case management guidelines.

The MDH will continue to evaluate high-risk populations to help ensure that appropriate screening for lead exposure is conducted and follow-up is provided for children with elevated blood lead. This will include refugee populations and individuals on Medicaid, which are two traditionally underserved groups. The involvement of primary care physicians who deal with diverse racial and ethnic communities is an especially critical aspect of identifying and treating lead poisoning in Minnesota. However, it is also important that all Minnesota physicians who see children regularly screen for lead exposure. This will help ensure that no child has to endure the lifelong negative health impacts that can result from exposure to lead. MM

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## Accessing the Guidelines

Copies of the Blood Lead Screening Guidelines for Minnesota, Childhood Blood Lead Case Management Guidelines for Minnesota, and Childhood Blood Lead Clinical Treatment Guidelines for Minnesota are available at: [www.health.state.mn.us/divs/eh/lead/](http://www.health.state.mn.us/divs/eh/lead/).

Copies can also be obtained by contacting Becky Bernauer at 651/215-0785 or [becky.bernauer@health.state.mn.us](mailto:becky.bernauer@health.state.mn.us).

For information about lead surveillance or epidemiology, please contact Myron Falken, Ph.D., at 651/215-0877 or [myron.falken@health.state.mn.us](mailto:myron.falken@health.state.mn.us).

# Blood Lead Screening Guidelines for Minnesota

A physician should test a child at any age if

- 1) the parent expresses a concern about or asks that their child be tested for blood lead poisoning.
- 2) the child moved from a major metropolitan area or another country within the last 12 months.

## Routine Screen

Child health care providers should use a blood lead test\* to screen children at 1 and 2 years of age, and children up to 6 years of age who have not been previously screened, if

- 1) the child lives within the city limits of Minneapolis or St. Paul; or
- 2) the child receives services from Minnesota Care (MnCare), the Supplemental Food Program for Women, Infants, and Children (WIC), or Medical Assistance (MA), which includes the Prepaid Medical Assistance Program (PMAP); or
- 3) the child does not fit the criteria above, and the answer to any of the following questions is “Yes” or “Don’t Know.”

- During the past 6 months has the child lived in or regularly visited a home, childcare facility, or other building built before 1950?
- During the past 6 months has the child lived in or regularly visited a home, childcare facility, or other building built before 1978 with recent or ongoing repair, remodeling, or damage (such as water damage or chipped paint)?
- Has the child, or his/her sibling, playmate, or housemate had an elevated blood lead level?

## Periodic Evaluation

In order to monitor a change in the child’s status, administer the following questions annually to all children 3 to 6 years of age whose previous test results were less than 10 µg/dL. Screen the child with a blood lead test\* if the answer to any of the following questions is “Yes” or “Don’t Know.”

Since the child’s last blood lead test:

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

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

For more information about lead screening, call the Environmental Impacts Analysis Unit at 651/215-0700; or 800/657-3908; or TTY 651/215-0707. Environmental Impacts Analysis Unit, P.O. Box 64975, St. Paul, MN 55164-0975.

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