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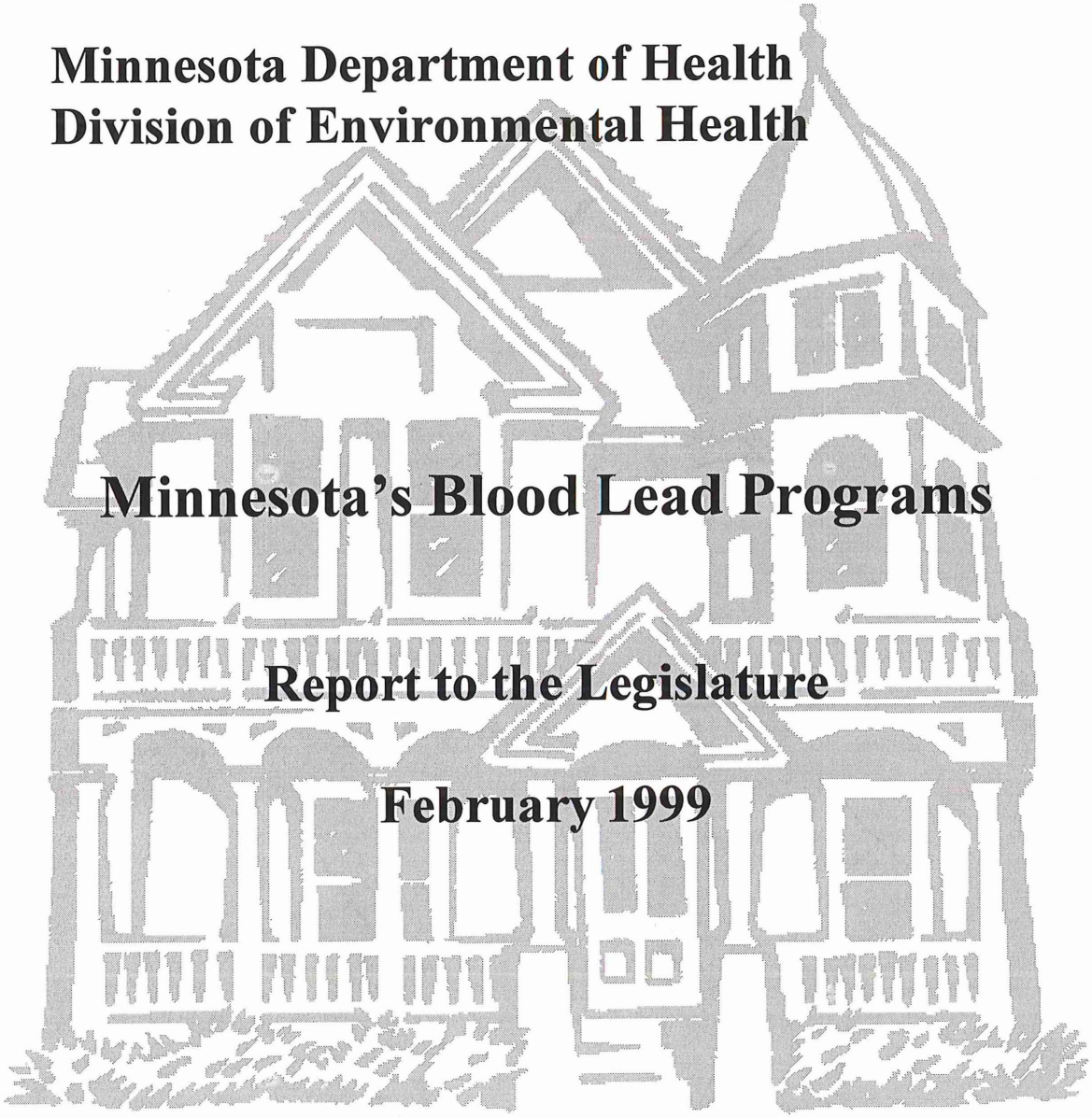

Minnesota's Blood Lead Programs

Report to the Legislature

February 1999

MINNESOTA MDH DEPARTMENT OF HEALTH

Minn. Stat. 144.9509 Subd. 3
Minn. Stat. 144.9503 Subd. 7(c)

1995 Minn. Laws Chap. 213
Art. 1 Sec. 11 Subd. 3

1998 Minn. Laws Chap. 407
Art. 2 Sec. 55

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February 1999

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MINNESOTA'S BLOOD LEAD PROGRAMS

REPORT TO THE LEGISLATURE

EXECUTIVE SUMMARY

This report focuses on the standards and rules, set forth in statutes, that establish appropriate interventions to reduce lead in the blood of a child diagnosed with an elevated blood lead level. This report is required by Minnesota Statutes, section 144.9509, subd. 3, and Minnesota Statutes, section 144.9503, subd. 7, paragraph (c); which direct the commissioner to report on lead program activities.

Background

Each year, approximately 35,000 Minnesota children (ages 1 to 5) are tested for blood lead and more than 2,600 are diagnosed with elevated blood lead (10 micrograms of lead per deciliter of whole blood). Of these, about 360 children are identified each year with blood lead levels (20 micrograms per deciliter or greater) that require significant medical and environmental intervention. National prevalence estimates are that Minnesota could expect to find close to 4,000 children that require environmental intervention. The true prevalence of elevated blood lead in Minnesota's adults and children is not known. Studies to determine the prevalence of elevated blood lead in children are recommended but cannot be conducted without additional funding.

State and local programs are in place to prevent elevated blood lead in children and to reduce exposures for a lead-poisoned child. These programs are funded through a combination of local, state, and federal dollars. Boards of health serving ten counties and the cities of Minneapolis, Bloomington, and Richfield are responsible for follow-up of lead poisoned children. The Minnesota Department of Health (MDH) is responsible for follow-up of children in all other parts of the state.

Education and Outreach Program Activities

Statewide, MDH conducts a wide variety of programs that address the educational needs of families, the community, and private and public care providers. These activities are currently targeted to areas of high risk, and needs assessments are being conducted to identify new areas for outreach. Locally, innovative approaches are being used and evaluated that meet specific needs of individual communities. MDH will need to continue to exploit new audiences and new partnerships–such as providing lead hazard reduction information in hardware stores. In addition, MDH will need to assess needs of additional at-risk populations and tailor outreach activities to meet these needs. An important issue emerging in outreach and education is the need to educate primary care providers and health insurers about targeting high-risk populations with improved screening programs.

Surveillance and Secondary Prevention Activities
The state's role in surveillance and secondary prevention is to assess the magnitude and severity of lead poisoning; identify high-risk populations; and assure cases of lead poisoning are managed appropriately. Currently this is accomplished through a surveillance program that is accurate, complete, and identifies children promptly. The surveillance data show a need for increased screening in Medicaid and refugee populations. A strategy for evaluating and implementing case management throughout the state is necessary in order to assure children receive consistent and appropriate care.

Regulatory Activities
MDH revised its lead regulations effective February 1, 1999. These rules were revised to ensure consistency with both the 1998 amendments to the Childhood Lead Poisoning Prevention Act and U.S. Environmental Protection Agency lead regulations adopted in August 1996. MDH licenses lead-related disciplines including risk assessors, inspectors, supervisors and workers, and approves lead training courses. Compliance monitoring of regulated lead work is a major element of the enforcement of these revised regulations.

Lead-Safe Property Certification
MDH received a mandate from the 1998 Minnesota Legislature requiring the development of a voluntary Lead-Safe Certification Program for property owners. A major goal of this voluntary program is to educate rental property owners about how to make their properties lead-safe, and to prevent children living in rental property from becoming lead poisoned. The first part of the lead-safe property certification program, development of four lead informational fact sheets, was completed December 21, 1998.

Resource Limitations
Resource limitations affect the ability of people to comply with Minnesota's lead standards and rules, and the ability of state and local agencies to enforce the standards and rules. There is little funding available to assist property owners to perform lead hazard reduction. Except for competitive grants for lead-safe housing, boards of health do not receive state funding to perform lead risk assessments. Cost is the primary obstacle to both voluntary and legally ordered lead hazard reduction in homes. The residences for which lead orders are issued are usually rental properties or owner-occupied affordable housing. Voluntary lead hazard reduction is seldom done, because it is not perceived as increasing the value of the property, or increasing the rent that can be charged. Funding sources are major future concerns for lead surveillance and prevention programs. Most lead program surveillance positions are federally-funded and any reductions in funding will reduce resources to levels that are not adequate to support quality surveillance and prevention activities.

Conclusions
Over the past two years, MDH and local lead programs have made significant accomplishments in addressing the problem of lead poisoning in Minnesota. These accomplishments include an improved lead surveillance system, innovative outreach projects targeted to high-risk communities, revising the lead regulations, and successful application for competitive federal lead grants.

MDH is enforcing all current lead standards and rules. Rules that were effective on February 1, 1999, meet U.S. Environmental Protection Agency requirements that will allow the state to enforce all lead poisoning prevention regulations. MDH has adequate enforcement authority and the current enforcement and inspection workload of department staff is manageable within existing resources.

During the past two years, MDH and local lead programs have greatly expanded their lead education and outreach activities for the public including targeted outreach to high-risk communities. Because the general public includes people with widely differing levels of education and cultural backgrounds, effective education and outreach must be appropriate for each target audience. One new educational tool, the lead education flip chart, is expected to be used by local health agencies throughout Minnesota. Innovative education programs, such as the rental property workshops, have successfully reached new partners in the effort to prevent childhood lead poisoning. A lead needs assessment for rural Minnesota will provide direction on how to reach communities outside of the Twin Cities metropolitan area.

The federal grant program funds that are passed through to local agencies have been well spent in primary prevention efforts aimed at addressing lead poisoning, cleanup of lead contaminated property and secondary prevention efforts for children with elevated blood lead levels including health education and outreach activities.

MDH blood lead surveillance system has also made great strides during the last two years and an evaluation completed in September 1998 showed that the quality of data is improving. The department's blood lead survey and surveillance activities are, to a significant extent dependent on continuing federal grants. Stable funding sources are very important for surveillance activities to be maintained.

Currently in Minnesota, there is no way to assure that all children who have elevated blood lead levels are identified and treated, and their residence returned to safe conditions. Not all children enrolled in Medicaid are being tested for lead even though they are eligible for this test.

There are gaps in both environmental and medical case management. MDH needs to improve communication with clinicians and local public health agencies that are providing case management. In particular, MDH and the Minnesota Department of Human Services need to work with providers of Early, Periodic Screening, Diagnosis and Treatment services (EPSDT), also known in Minnesota as Child and Teen Checkup services, to increase the compliance rate for blood lead screening of children enrolled in EPSDT.

The current resources for dealing with lead poisoning prevention cannot address all the needs. Funding for property owners to perform their own lead hazard reduction in cases where a child has been identified with elevated blood lead levels, or for preventive maintenance, would go a long way to address the problem. Similarly, additional funds would help temporary relocation of families who are displaced from their primary residences when lead hazard reduction work is being performed.

TABLE OF CONTENTS

I. INTRODUCTION

This report is required by Minnesota Statutes, section 144.9509, subd. 3, and Minnesota Statutes, section 144.9503, subd. 7, paragraph (c).

Minnesota Statutes, section 144.9509, subd. 3, states:

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

Minnesota Statutes, section 144.9503, subd. 7, paragraph (c), states:

> By January 1, 1999, the commissioner in cooperation with interested parties and informed persons and using the meeting structure and format developed in paragraph (b), shall develop lead-safe informational directive fact sheets on the following topics:
>
> (1) maintaining floors, walls, and ceilings;
> (2) maintaining and repairing porches;
> (3) conducting a risk evaluation for lead; and
> (4) prohibited practices when working with lead.
>
> The commissioner shall report to the legislature by January 1, 1999, regarding the development of the provisions required under this paragraph.

This report cost $1,500 to prepare, including staff time and printing costs.

II. BACKGROUND

Lead has been used in a wide variety of industrial and consumer products. Some of these uses left reservoirs of lead in the environment. The sources that most commonly expose people to lead are deteriorated lead-based paint in older housing, dust contaminated with lead from both lead-based paint and lead-contaminated soil, soil contaminated with lead from deteriorated exterior lead-based paint and from the combustion of leaded gasoline, and drinking water contaminated with lead from plumbing pipes and fixtures.

Children less than 72 months of age are most susceptible to adverse health effects from lead, for both behavioral and physiological reasons. Small children explore their environment by putting objects into their mouths. They also absorb a higher percentage of ingested lead since they are growing at a rapid rate and need to take in nutrients. The body "mistakes" lead for calcium. Lead particularly damages the nervous system, liver, and kidneys. Ultimately, most lead will be

stored in the skeleton, where it may stunt a child's growth. Lead may also cause permanent problems with learning and behavior in young children.

As research linked adverse health effects with lower blood lead levels, the U.S. Consumer Product Safety Commission and the U.S. Environmental Protection Agency (EPA) responded with restrictions on the lead content of newly manufactured paint in 1978 and lead content of gasoline beginning in 1976. However, the lead reservoirs built up by past activities largely remain in the environment and present a continuing hazard.

A. Estimates of the Prevalence of Lead Poisoning

Each year children and adults in Minnesota are diagnosed with levels of lead in blood that require medical and environmental intervention. In 1997, a fairly typical year, the Minnesota Department of Health (MDH) received the results of blood lead tests of 37,455 children less than six years of age. Of these, 7 percent, or 2,614 children, had elevated blood lead levels (10 µg/dL or greater). Of all of the children tested, 358, or 1 percent, had a level of 20 µg/dL or greater. A child with this level of lead in blood receives medical and environmental intervention that includes an assessment of the child's home environment. These statistics are rates of elevated blood lead within a tested population, in contrast to a true prevalence of elevated blood lead in the population of all Minnesota children. Since not all children in Minnesota are tested for blood lead, MDH expects that blood lead testing (also called screening) in Minnesota is currently conducted on children that health care providers believe are at risk of having an elevated blood lead. The reasons that health care providers use in selecting which children to test are not fully understood and currently are being researched by MDH.

According to the most recent nationwide assessment of elevated blood lead, 8.9 percent of children ages 1 to 5 have blood lead levels of 10 µg/dL or greater. More than 353,000 children under age 5 live in Minnesota (1994 estimates) and Minnesota may find as many as 31,000 children have elevated blood lead. National estimates are that 1.1 percent of children (ages 1 to 5) have a blood lead level of 20 µg/dL or greater. In Minnesota, this means that as many as 3,900 children may have blood lead levels that require medical and environmental intervention.

Private health care providers in Minnesota, and the public health agencies that work in partnership with them, may only be detecting one tenth of the children that are exposed to harmful quantities of lead. It is not clear, however, if these national estimates result in an underestimation or overestimation of the prevalence of elevated blood lead in Minnesota children. Answering that question will require studies that specifically measure prevalence. A Blood Lead Surveillance Advisory Group of physicians, epidemiologists, and other health care professionals was convened by MDH to advise the state on surveillance. This group advised MDH to conduct such studies, particularly in rural areas of the state. These studies are costly and will require special funding. MDH staff are making an application to the U.S. Centers for Disease Control and Prevention (CDC) that will assist in planning prevalence studies.

Much less is known of the prevalence of elevated blood lead among adults. Test results are reported to MDH, but very few adults are tested. In 1997, 63 adults were diagnosed with a blood lead level of 40 μg/dL or greater. The majority of these cases are due to occupational exposure.

B. Lead Programs in Minnesota

The cities of Minneapolis and St. Paul began lead prevention programs in the 1970s; MDH followed in 1986. Since then, the state has established a statewide surveillance program, state and local public health provide environmental assessment, and education and outreach activities are in place statewide as well as in many locales. All of this is accomplished through a variety of programs funded by the state or by federal agencies.

Legislation enacted in 1986 required the local board of health to provide medical and environmental follow-up for a lead-poisoned child. No funding was established to carry out this responsibility. MDH does not know the entire history of how locally-administered lead programs were created prior to this date, such as the programs in Minneapolis or St. Paul. Currently, both Minneapolis and St. Paul - Ramsey County receive some federal funding through the Department of Housing and Urban Development (HUD). Local programs periodically apply to the state for additional support in carrying out intervention programs.

In January 1986, MDH began conducting program activities mandated by Minnesota statutes. Those activities included surveillance, health education, and regulation. The statute was recodified in 1995 because numerous amendments during the preceding legislative sessions had made the intent of the statute unclear. A major policy change was enacted in 1995 that allowed most boards of health to relinquish to MDH a 1989 mandate on boards of health to conduct lead inspections. At this time, local boards of health serving Becker, Clay, Dakota, Hennepin, Mahnomen, Norman, Ramsey, St. Louis, Stearns, and Wright Counties and serving the cities of Minneapolis, Bloomington and Richfield retain responsibility for providing the medical and environmental follow-up for lead-poisoned children.

Initially, state-mandated activities were entirely state-funded, but MDH and some boards of health have become increasingly dependent on federal grants to carry out lead program activities. In 1992 the Minnesota Housing and Finance Agency obtained a HUD grant that provided funding to the cities of Minneapolis, St. Paul, and Duluth. MDH began receiving funding from EPA in 1995 to develop and implement an accreditation program for lead-related work disciplines, and to improve blood lead surveillance. Federal funds (National Institute of Occupational Safety and Health) for adult blood lead epidemiology and surveillance were awarded to the state beginning in 1995. The CDC began making annual awards to the state in 1996 to conduct surveillance and to carry out prevention activities targeting rental property owners. In July 1997, MDH received a three-year grant from HUD for lead hazard reduction in private housing. Much of this money is passed through to the Housing and Redevelopment Authority of Duluth and to the St. Paul - Ramsey County Department of Public Health. HUD has also awarded grants directly to the cities of Minneapolis and St. Paul.

Federally-mandated duties were established in regulations adopted by the EPA on August 30, 1996. The EPA regulations include provisions for training and certifying lead professionals, accreditation of lead training courses, and standards for performing lead inspections and abatement. During 1998, state statutes were amended to adopt federal lead-related terminology according to EPA regulations. MDH adopted rules that are at least as stringent as the EPA regulations.

III. EDUCATION AND OUTREACH PROGRAM ACTIVITIES

"Primary prevention" means elimination or reduction of toxic lead exposure before blood lead levels become elevated. "Secondary prevention" means intervention to mitigate health effects on people with elevated blood lead levels. Primary prevention is the ideal goal of public health but secondary prevention is necessary when the ideal is not achieved. Primary prevention includes provision of health education to families with young children. Informational materials are developed for a variety of target audiences, such as health care providers and non-English speaking families.

A. Description of Education and Outreach Activities

MDH provides leadership in lead education and outreach services to Minnesotans, and to many partners who work in the lead poisoning prevention field. MDH has a statutory requirement to provide primary and secondary lead outreach services. The goals of lead education in Minnesota are to prevent childhood lead poisoning from occurring (primary prevention), and to work with families to lower blood lead levels once a child is adversely affected by lead (secondary prevention). Lead education and outreach address the core public health "assurance" function by guaranteeing that children adversely affected by lead receive the services they need to lower their elevated blood lead levels.

MDH has many partners in the fight against childhood lead poisoning. The city and county allies in the Twin Cities metropolitan area, and the local boards of health in Greater Minnesota provide a range of primary and secondary prevention services to address the lead issue in their communities. A description of education and outreach activities performed by MDH or by local health departments follows.

1. State Programs

A variety of lead education and outreach activities have addressed MDH public health goal to "reduce Minnesotans' exposure to environmental health hazards." This MDH goal includes childhood lead poisoning as one topic of concern. The projects discussed below are not exhaustive but do represent the scope of the education and outreach activities developed and implemented by MDH.

a. Lead Technical Support/Phone calls and Lead Materials

MDH staff respond to questions from the general public and the regulated parties about lead poisoning prevention and remediation. In addition, staff provide technical support to many partners who work with young children, and families with young children, to prevent lead poisoning. During fiscal year 1998, MDH staff responded to approximately 4,000 calls from the general public, health care providers, training course providers, and people in lead-related occupations. MDH is receiving a similar rate of calls for the first half of fiscal year 1999.

Approximately 100,000 pieces of lead education material are distributed annually. This information includes responses to callers, in addition to contacts from MDH's local partners and various clinics, and from the regulated parties. These requests range from information on lead exposure prevention and education pieces for the general public, to providing copies of the Minnesota rules and statutes to the regulated parties, and furnishing lists of MDH-licensed lead professionals to property owners interested in doing lead work on their properties.

b. Needs Assessment for Families in Greater Minnesota

MDH is currently assessing the lead education needs of families with young children living in Greater Minnesota. Lead poisoning is not a problem confined to the inner-city. Historically, lead poisoning cases have been reported in every county in Minnesota. Many lead prevention and remediation services are available in the Twin Cities, seven-county metropolitan area. But MDH needs more information about the lead prevention attitudes, knowledge and preventive behaviors of people living in Greater Minnesota so that appropriate methods and educational materials can be developed. A representative sample of households with young children living outside the Twin Cities metropolitan area will be contacted via a telephone survey to assess their lead knowledge, attitudes, and preventive behaviors. This information will help MDH to design effective lead education materials and lead poisoning prevention strategies for Greater Minnesota.

MDH has proposed another project that will determine the lead education needs within a minority population in Minnesota. Members of the Hispanic community living in Greater Minnesota will be asked to participate in focus groups designed to assess their lead poisoning prevention attitudes, knowledge and preventive behaviors. Population-specific interventions will be developed based on the information from this series of focus groups. Children within the Hispanic community continue to be at high risk for lead poisoning due to their families' use of traditional medicines which historically have contained lead. Additionally, many members of the Hispanic community in Greater Minnesota are migrant workers and the traditional risks associated with this unique population, substandard housing, low wages, and poor nutritional status, also made their youngest members vulnerable to the effects of lead.

c. *Healthy Homes/Healthy Kids* Flip Chart

MDH has recently completed a lead education tool for use by its partners. This tool, titled *Healthy Homes/Healthy Kids*, is a flip chart which provides a complete lead education message for educators working with families with young children. This standardized tool may be used to provide families with information necessary to reduce exposure to sources of lead; lower blood

lead; and prevent further poisonings. The flip chart combines text and graphics to prompt and maintain discussion and dialogue between the family and educators.

The flip chart contains images of cultural diversity. Every attempt was made to incorporate people of color within the flip chart images. The flip chart could be used to educate families whose primary language is not English, with the assistance of a qualified interpreter.

Although the flip chart was initially developed for local public health partners for use with families with a lead poisoned child, it has been widely requested by a variety of agencies, within and outside of Minnesota, who either work specifically with the lead issue, or work with families with young children. The flip chart may be used in a clinical setting with families who may or may not be aware of the dangers of lead, and other adaptations of the flip chart are currently being considered to address primary lead prevention.

d. *Lead Link*

MDH produces a newsletter three times a year which reaches many lead stakeholders across Minnesota, and nationally. The initial audience for the newsletter, called the *Lead Link*, was the regulated community. The readership has grown beyond licensed lead professionals, and approved training course providers, to reach many of MDH's lead partners. These partners include all local public health agencies, neighborhood groups, housing authorities, contractors, day care providers, rental property owners, minority-centered agencies, and health care providers. The *Lead Link* provides lead technical and regulatory updates to its readers. The readership is approximately 1,000.

e. Rental Property Owner Workshops

State and local lead inspectors estimate that more than 90 percent of the cases of childhood elevated blood lead levels occur in rental property. However, rental property owners have not been seen as traditional partners in primary prevention of lead poisoning. Teaching rental property owners how to create and maintain lead-safe property has been a successful community strategy to increase lead awareness. During a workshop, participants are taught by health and legal experts. An attorney's perspective on the federal lead disclosure law is featured. Participants receive cleaning supplies to reinforce messages of living safely with lead.

This health education strategy began in Minneapolis and St. Paul, and now includes Duluth and Northwest metro suburbs. Eleven workshops have been held and have trained 201 rental property owners or managers. A conservative estimate based on personal interviews and telephone callbacks is that these workshops reached owners and managers of units that housed 900 tenants under the age of six.

In addition to the workshops, staff working with the rental property owner community have placed lead hazard reduction equipment and supplies in hardware stores and provided lead risk assessor and inspector training to rental property owners. One challenge in working with rental property owners is they lack time, energy and resources to become aware of lead issues.

2. Local Activities

In the 1995 and 1998 legislative sessions, the Minnesota Legislature allowed boards of health, except those serving cities of the first class which are Minneapolis, St. Paul, and Duluth, to relinquish their lead risk assessment authority and responsibility to MDH. This opportunity extends until December 31, 1999. MDH is now responsible for completing environmental assessments in 77 counties in Minnesota. Some local boards which have relinquished their lead risk assessment authority to MDH continue to provide lead education services to the county.

When a young child or pregnant woman is identified with lead poisoning, MDH or the board of health conducts a lead risk assessment of the home. Depending upon the extent to which the blood lead is elevated, a lead risk assessment of the home, and education about how to lower the blood lead level, are required by Minnesota Statutes. The purpose of a lead risk assessment is to locate the sources of lead that are causing the problem. If the amount of lead in the paint, dust, drinking water, or bare soil on the property exceeds state standards, lead hazard reduction orders are issued to the property owner to correct the lead problems. Lead education is recommended for families of all children who have blood lead levels of at least 10 micrograms of lead per deciliter of whole blood (μg/dL).

Although childhood lead poisoning is not confined to the inner-city, most of the reported cases of elevated blood lead levels in Minnesota are from the cities of St. Paul and Minneapolis. The St. Paul - Ramsey County Public Health Department, and the City of Minneapolis Lead Program are instrumental in providing primary and secondary childhood lead poisoning prevention services to their communities, with the support of their many community-based partners.

MDH sends written notification of elevated blood lead levels in children under the age of six, and pregnant women, to boards of health that retained jurisdiction for responding to cases of elevated blood lead levels. In turn, that board is responsible for the follow-up for children identified with elevated blood lead levels. For children with elevated blood lead levels, this follow-up includes a lead risk assessment and lead education. The lead risk assessment of the property is performed to determine the source of the lead exposure and to provide the basis for ordering elimination of the source. Lead education is provided to families on how to lower the child's blood lead level, and prevent further exposures. In addition to these secondary prevention responsibilities, boards of health, especially the Minneapolis and St. Paul - Ramsey County boards, have developed innovative primary prevention strategies to reduce the impact of childhood lead poisoning in their communities.

a. St. Paul - Ramsey County Outreach and Education

The St. Paul - Ramsey County Public Health Department's Lead Hazard Control Program offers a variety of childhood lead poisoning prevention services to its citizens. This program uses a combination of local, state, and federal dollars to provide primary and secondary prevention activities in Ramsey County. The health department provides environmental, medical, and educational follow-up for children with elevated blood lead levels. Primary prevention services are also provided to high risk families. Some examples of the primary and secondary services offered by the St. Paul - Ramsey County Public Health Departments are listed below:

- Swab teams combine lead-specific cleaning with weatherization services. This approach is designed to reduce the lead hazards in the home, and to lower the child's blood lead levels by improving and maintaining the home environment. Swab teams also provide lead education to the family.

- Subsidies to property owners for completing ordered or voluntary lead hazard reduction are available. Families performing voluntary lead hazard reduction is offered funding to clean up or remove sources of lead on the property before a child's blood lead level becomes elevated.

- Lead education is provided to families with a child with an elevated blood lead level by a public health nurse-educator. Health department public health nursing staffs also train professionals who provide services for young children, and host lead screening clinics at Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinics.

b. City of Minneapolis Outreach and Education

The City of Minneapolis Lead Program also offers a variety of lead prevention services to Minneapolis citizens. The City of Minneapolis maintains staff licensed by MDH to provide follow-up for children that are identified with elevated blood lead levels. The city contracts the medical and environmental follow-up services provided by public health nurses. The city's vendor for these activities is the Metropolitan Visiting Nurses Association (MVNA). A HUD grant allows Minneapolis to subsidize ordered lead hazard reduction work for Minneapolis property owners. This includes paying for ordered lead hazard reduction work, relocating families while the work is being completed and cleaned up, and providing the family lead education on ways to prevent further lead exposures. A state-funded grant for lead-safe housing provided by MDH also assists in relocating families.

The HUD grant also provides for a primary prevention program of window replacement and repair. The "10,000 Windows!" program is locally-administered by neighborhoods with high concentrations of older housing, and families with the lowest family incomes. The HUD grant also funds the "10,000 Windows! Family Day Care Project" which will replace windows in 100 family home day cares located in high-risk areas. Temporary child care sites are available for providers to continue doing business while they are out of their homes. Nurse-educators from MVNA have developed a child-centered lead prevention presentation for the children in the participating child care homes.

The HUD grant also funds multiple programs that provide "train the trainer" lead education for day care providers, social workers, and program staff from childhood enrichment programs. Direct education to children and families is also provided through special efforts such as a summer parks program. The parks program uses healthy snacks, coloring books with lead information, and stickers to help teach young families about the dangers of lead.

B. Evaluation of Outreach and Education Programs

During the past two years, MDH and local agencies have emphasized the development of programs in outreach and education that are tailored to the needs of specific, high-risk communities. In addition, these programs are closely related to the mandates of Minnesota Statutes and to the goals of federal agencies that provide grant funding. Fortunately, the needs of communities that are high-risk for lead poisoning are the focus of most of the federal grants that MDH and local agencies receive.

Since a variety of public health agencies, nonprofit organizations, and the private sector are involved with public and professional education, greater coordination is needed. For example, MDH may need to establish a long-term coalition that represents private as well as public health agencies that are responsible for lead health education. As private health care providers and health insurance organizations become more involved in providing lead education and follow-up, MDH will need to design education programs for primary care providers.

IV. SURVEILLANCE AND SECONDARY PREVENTION ACTIVITIES

Once a child is identified with an elevated blood lead level, health care providers, including health agencies, begin secondary prevention, which is intended to lower the blood lead level of the child. MDH collects and reports data on blood lead levels, and establishes the minimum requirements for managing the environmental and medical follow-up of a lead-poisoned child.

Surveillance is the systematic collection of data that can be used to monitor the occurrence of diseases or conditions to determine the extent and magnitude of disease. Surveillance includes data receipt, management, analysis, and dissemination. Secondary prevention includes family education about sources and reduction of lead exposure; counseling on the child's nutrition or diet; management of the child's environment (such as moving a family to temporary lead-safe housing); and medical treatment of the child (such as iron supplements to decrease absorption of lead or chelating agents to lower blood lead).

A. Description of Surveillance and Secondary Prevention Activities.

1. Surveillance

MDH is responsible for collecting blood lead data and demographic information of all Minnesota residents tested for blood lead poisoning. In order to effectively characterize the extent of the problem of blood lead poisoning in Minnesota, it is essential to collect complete, accurate and timely information.

MDH maintains a blood lead database which stores the results of blood lead testing of children and adults in Minnesota. The blood lead results are reported to MDH by laboratories which analyze blood samples for lead. About 52,000 reports are received annually, but MDH believes that not all blood lead results are reported. In addition, MDH cannot identify all of the cases of elevated blood lead because not all children are tested for blood lead. Since not all children are tested, it is necessary to perform studies and surveys to better understand the extent of blood lead testing and the number of elevated blood lead cases.

Blood lead surveillance staff have concentrated their efforts on improving data quality over the past several years. Staff have begun to work closely with reporting laboratories, improved internal data processing procedures and begun to generate information useful in targeting populations at risk.

Although the blood lead surveillance program has improved the quality of information collected, data gaps still exist. For example, racial information was missing in 48 percent, 39 percent, and 38 percent of the reports received during 1995 to 1997, respectively. Due to the missing information, it is difficult to draw conclusions regarding the racial make-up of the population at risk for lead exposure.

a. Screening Guidelines

Surveillance data are used to monitor screening activities throughout the state and to identify high-risk populations. These data can be used to guide the screening (blood lead testing) practices of primary care providers. In November 1997, CDC released new guidelines "Screening Young Children for Lead Poisoning." This document encourages states to develop guidelines for areas and situations in which all children should be screened and encourages some type of risk questionnaire to be used in areas of low risk. MDH distributed these guidelines to local public health departments, and formed an advisory group to assist in the development of a statewide screening plan. The advisory group includes physicians, representatives of health maintenance organizations, insurers, community advocates for lead prevention, policy makers, housing experts, local public health representatives, and representatives of other state programs involved in childhood lead prevention.

b. Medicaid

Children enrolled in Medicaid receive specific health care services. In every state this includes Early Periodic Screening and Diagnostic Testing (EPSDT), otherwise known in Minnesota as Child and Teen Checkup. EPSDT services require a lead test for children at one and two years of age, or anytime between the ages of three and six if the child was not tested at ages one or two. Nationally, there is great concern that these requirements are not being met. In 1998, the Government Accounting Office estimated that only 20 percent of the children eligible for a blood lead test are being tested. The same study showed that Medicaid children made up 60 percent of the children in this country who have elevated blood lead levels. A 1996-1997 Minnesota quality review study of health maintenance organizations showed a compliance rate of 32 percent. MDH and the Minnesota Department of Human Services have met with representatives of the health plans that reimburse physicians that care for children on Medicaid to discuss this concern. At least three plans have now taken steps to increase screening of their Medicaid clients. MDH will need to continue to inform care providers of the high rate of lead poisoning among the Medicaid population. MDH will also need to continue to inform health care providers of the state and federal requirements to test Medicaid children for elevated blood lead.

c. Refugee Health

The immigrant population in the Twin Cities area, and increasingly in Greater Minnesota, continues to grow. From 1990 to 1995 the minority population increased 42 percent, compared

to 3 percent for the white non-Hispanic population. Minnesota is home to the sixth largest total refugee population in the country. Nationally, studies have shown that immigrant populations in the United States have a higher rate of elevated blood lead than the general population.

Staff from different MDH programs are comparing information from their respective databases to understand blood lead screening and poisoning in Minnesota. A high rate of elevated blood lead was found in preliminary analysis of the data. In addition, the rate of screening varied widely depending on the country of origin. MDH is providing these data to refugee health programs so that appropriate lead screening and prevention strategies can be developed.

d. Adult Blood Lead Epidemiology and Surveillance

The Adult Blood Lead Epidemiology and Surveillance (ABLES) program was implemented in October 1995. Program activities include a follow-up telephone survey on adults with elevated blood lead levels, and a minimal amount of health education. The program reports the total number of adults tested for lead and blood lead levels to CDC and the National Institute for Occupational Safety and Health (NIOSH). The number of adults tested and reported by laboratories to MDH in 1997 was 4,377. Of the adults tested, 255 (about 5.8 percent) had blood lead levels equal to or greater than 25 µg/dL, the level at which CDC considers blood lead levels to be elevated in adults.

2. Case Management

Medical follow-up and case management ranges from education of families to treatments with drugs that lower blood lead levels. The medical treatment is usually not done until blood lead levels are 45 µg/dL or more but this also depends on the physician's evaluation of other factors. Education to improve nutrition and thereby decrease lead absorption is a fundamental activity of case management for lead poisoning. Monitoring of the child through continued testing is typically part of the management. Case management that is not performed in a clinician's office takes place through home health visits by public health nurses.

Environmental follow-up and case management takes place when a child's venous blood lead level reaches 20 µg/dL or persists in the 15 to 19.9 µg/dL range for at least 90 days. Public health staff visit the family and assess risks to the child. This visit often results in orders to the property owner to reduce lead hazards found during the inspection. Case management includes follow-up to ensure that the property owner complies with the orders, whether or not the child continues to live in the home. In many cases, the child may be moved to safe housing while lead hazard reduction is performed.

B. Evaluation

1. Surveillance

Evaluation of the blood lead surveillance system was conducted according to CDC recommendations twice during the past three years. As a result of these in depth evaluations, improvements have been made in collecting data to assure the completeness, accuracy, and timeliness of the blood lead surveillance system. Periodic evaluations and constant monitoring of data collection are integral to maintaining a quality surveillance system. The surveillance system is currently providing the high quality data necessary for planning effective secondary

prevention. Maintenance of a high quality system is labor intensive. Currently, both state and federal funding sources for lead programs in Minnesota contribute to staffing and operating the surveillance system.

Preliminary studies of blood lead levels in Medicaid and Refugee populations show that these populations have a high rate of blood lead poisoning compared to the tested population as a whole. In addition, Minnesota data show that Medicaid children are not receiving the screening services that they are entitled to receive. Both of these high-risk populations must be a priority for increased screening and case management in the future.

2. Case Management

A comprehensive evaluation of case management activities throughout Minnesota has not been conducted. However, one recent effort in one of the highest-risk areas of the state is a prototype for case management evaluation. Gaps in both environmental and medical case management were investigated in this study conducted in neighborhoods in north Minneapolis during the past two years. MDH found that screening was extensive in the clinics serving this area and environmental follow-up was timely. MDH also found that gaps in service, either medical or environmental, were the result of poor communication between medical and environmental case managers, including clinicians, the city, public nurses, and MDH. As a result of this study, MDH found that the state and local health departments need to share information on causes and outcomes of each case of poisoning in Minnesota so that the state can assure cases are managed in an appropriate and consistent manner from locale to locale.

MDH has anecdotal information from many sources that a difficult part of the environmental case management of every case of blood lead poisoning is assisting the property owner in finding the resources to remove or repair lead hazards. In many cases, funds from federal, state, or municipal loan and grant programs are not available to perform lead hazard reduction. Anecdotal information also suggests that a physician or parent may not have a child tested because of concern over the cost of complying with lead hazard reduction orders.

V. REGULATORY ACTIVITIES

A. Rulemaking

Since 1993, MDH has licensed lead contractor/supervisors, lead workers, and lead inspectors and has approved the training courses required for individuals to qualify for licensure. As of August 1998, there were 140 licensed inspectors, 200 licensed contractor/supervisors, and 28 licensed workers. Four training providers have one or more approved lead training courses.

In August 1996, the EPA adopted regulations for licensing individuals and certifying firms that perform regulated lead work. EPA will approve state lead programs that are at least as protective of public health as the federal lead regulations. In April 1997, MDH published a notice in the *State Register* of the department's intent to conduct rulemaking that would make the state rules consistent with the federal regulations. The proposed rules were published in the *State Register* on September 21, 1998, and the public comment period closed October 21, 1998. Written

comments were received from 5 individuals and MDH clarified some rule language as a result. No requests were received for a public rulemaking hearing. The rules are effective February 1, 1999.

After the effective date of the rules, MDH will license qualified individuals as lead inspectors, lead risk assessors, lead workers, lead supervisors, and lead project designers. MDH will certify companies that perform regulated lead work as certified firms. MDH plans to submit an application for approval to EPA in early 1999.

Once the revised rules are adopted, MDH will conduct compliance monitoring of regulated lead work, including lead inspections, lead hazard screens, lead risk assessments, lead hazard reduction projects, and clearance inspections. MDH plans to monitor training providers for compliance with training requirements by auditing training courses. Compliance monitoring under the previous rules was largely done in response to complaints received by MDH. Compliance monitoring under the new rules will be performed on a regular schedule and will be much more thorough.

B. Enforcement

The Minnesota Health Enforcement Consolidation Act provides adequate authority for lead enforcement by MDH. No additional enforcement authority is needed. MDH prepared the Administrative Penalty Order plan, as required by this Act, to standardize the agency's enforcement actions in response to violations of statutes or rules and to make penalties commensurate with violations. Since the 1997 report to the Legislature, MDH has used the Administrative Penalty Order provisions of the Health Enforcement Consolidation Act in only two cases, both involving contractors.

However, some problems are not amenable to an enforcement action. Legislation adopted in the 1998 session resolved two reporting problems for which enforcement actions were not feasible. The new statutory language requires every hospital, medical clinic, medical laboratory, other facility, or individual performing blood lead analysis to report the results after the analysis of each specimen analyzed, for both capillary and venous specimens, and epidemiologic information required in the statutes to MDH. One previous problem was that clinics were not required to report demographic information to their reference laboratories. The laboratories could report the blood lead levels but were unable to include demographic data unless the clinics provided this information. The other previous problem was that some reference laboratories are not located in Minnesota and are not subject to Minnesota reporting requirements. The amended statutes ensure that someone in Minnesota is responsible for reporting the information.

VI. LEAD-SAFE PROPERTY CERTIFICATION PROGRAM & NEW INFORMATIONAL DIRECTIVE FACT SHEETS

MDH received a legislative mandate from the 1998 Minnesota Legislature requiring the development of a voluntary Lead-safe Property Certification Program for property owners. A major goal of the voluntary Lead-safe Property Certification program is to educate rental property

owners about how to make their properties lead-safe, and to prevent children living in rental property from becoming lead poisoned. A lead-safe property is one which is safe for families to live in, and does not contain any sources of lead that are likely to cause an exposure to lead.

As part of the voluntary property certification process, the statutes required development of four lead-related informational directive fact sheets by January 1, 1999. The four titles are:

- Maintaining Walls, Floors, and Ceilings to Prevent Exposure to Lead
- Maintaining and Repairing Porches to Prevent Exposure to Lead
- Is Lead a Problem in Your Home? Conducting a Risk Evaluation for Lead
- Prohibited Methods for Removing or Cleaning Up Sources of Lead

Throughout the draft development process, the fact sheets were repeatedly reviewed internally by MDH staff with knowledge and interest in the lead issue. After the department completed its internal review of the four fact sheets, they were reviewed by an public advisory committee, whose comments were incorporated into the final versions.

The four new fact sheets were available via MDH Internet site on December 21, 1998. The new fact sheets will be professionally designed and color printed in paper-form for mass distribution early in 1999. The distribution plan for the fact sheets will be similar to the distribution plan for the original fact sheet series.

These four fact sheets will augment an existing series of eight fact sheets which provide information on working in a lead-safe manner when performing renovation or repair work in an older home likely to contain lead paint. The series is titled "Safely Working with Lead While Remodeling the Older Home."

The Department is recommending elimination of the program because it is too narrowly focused and is of a lower priority than other elements of the lead program. The department is completing the required tasks with the initial appropriation, and these will form the basis of future efforts.

VII. RESOURCE LIMITATIONS

Resource limitations affect the ability of people to comply with Minnesota's lead standards and rules, and the ability of state and local agencies to enforce the standards and rules. There is little funding available to assist property owners to perform lead hazard reduction. Except for competitive grants for lead-safe housing, boards of health do not receive state funding to perform lead risk assessments.

About 75 percent of the housing in Minnesota is old enough that it would be expected to contain at least some lead-based paint. However, in practice, lead standards and rules are applied to very little of this housing. By statute, MDH lead rules apply only to residential work that is specifically intended to accomplish lead hazard reduction. The rules apply to such work whether the work is done under lead orders or is done voluntarily. These rules do not apply, however, to

remodeling, repainting, renovating, or any other work undertaken for reasons other than lead hazard reduction, even if lead-based paint is disturbed in the process of completing the work. MDH has prepared a total of 12 statutorily-required, nonregulatory guidelines called "lead informational directives fact sheets," which are intended to provide safety advice for people engaged in these activities. See appendix C for the four most recent informational directive fact sheets.

Cost is the primary obstacle to both voluntary and legally ordered lead hazard reduction in homes. The residences for which lead orders are issued are usually rental properties or owner-occupied affordable housing. Voluntary lead hazard reduction is seldom done, because it is not perceived as increasing the value of the property, or increasing the rent that can be charged.

Boards of health serving three city governments and ten county governments have retained authority and responsibility for lead risk assessments. The Minneapolis Division of Environmental Health and the St. Paul - Ramsey County Department of Public Health have received state-funded grants for temporary lead-safe housing for families displaced by lead orders from the cities.

MDH is very dependent on federal grants for lead program activities. MDH currently receives five federal grants from HUD, EPA, and CDC. The HUD grants are subject to nationwide competition and are entirely competitive; there are no formula-based awards for these grants. EPA provides two annual grants; a cooperative agreement and an enforcement grant. The cooperative agreement grant has a formula base of $191,000 for Minnesota but MDH has successfully competed for about an additional $60,000 per year. The enforcement grant is entirely competitive and MDH has received awards from $40,000 to $50,000. CDC provides two grants; an annual grant for childhood lead poisoning prevention and blood lead surveillance, and an annual grant for adult blood lead surveillance. The childhood lead poisoning prevention grant is currently about $600,000 and the adult surveillance grant is currently about $25,000. MDH and local governments expect to continue to apply for the grants for which each is eligible but it cannot be assumed that competitive grants will continue to be awarded.

Funding sources are major future concerns for lead surveillance and prevention programs. Most lead program surveillance positions are federally-funded and any reductions in funding will reduce resources to levels that are not adequate to support quality surveillance and prevention activities.

VIII. CONCLUSIONS.

Over the past two years, MDH and local lead programs have made significant accomplishments in addressing the problem of lead poisoning in Minnesota. These accomplishments include an improved lead surveillance system, innovative outreach projects targeted to high-risk communities, revising the lead regulations, and successful application for competitive federal lead grants.

MDH is enforcing all current lead standards and rules. Rules that were effective on February 1, 1999, meet U.S. Environmental Protection Agency requirements that will allow the state to enforce all lead poisoning prevention regulations. MDH has adequate enforcement authority and the current enforcement and inspection workload of department staff is manageable within existing resources.

During the past two years, MDH and local lead programs have greatly expanded their lead education and outreach activities for the public including targeted outreach to high-risk communities. Because the general public includes people with widely differing levels of education and cultural backgrounds, effective education and outreach must be appropriate for each target audience. One new educational tool, the lead education flip chart, is expected to be used by local health agencies throughout Minnesota. Innovative education programs, such as the rental property workshops, have successfully reached new partners in the effort to prevent childhood lead poisoning. A lead needs assessment for rural Minnesota will provide direction on how to reach communities outside of the Twin Cities metropolitan area.

The federal grant program funds that are passed through to local agencies have been well spent in primary prevention programs aimed at addressing lead poisoning, cleanup of lead contaminated property, follow-up activities for children with elevated blood lead levels and health education and outreach activities.

MDH blood lead surveillance system has also made great strides during the last two years and an evaluation completed in September 1998 showed that the quality of data is improving. The department's blood lead survey and surveillance activities are, to a significant extent dependent on continuing federal grants. Stable funding sources are very important for surveillance activities to be maintained.

Currently in Minnesota, there is no way to assure that all children who have elevated blood lead levels are identified, and treated and their residence returned to safe conditions. Not all children enrolled in Medicaid are being tested for lead even though they are eligible for this test.

There are gaps in both environmental and medical case management. MDH needs to improve communication with clinicians and local public health agencies that are providing case management. In particular, MDH and the Department of Human Services need to work with providers of EPSDT services to increase the compliance rate for blood lead screening of children enrolled in EPSDT.

The current resources for dealing with lead poisoning prevention cannot address all the needs. Funding for property owners to perform their own lead hazard reduction would go a long way to address the problem. Similarly, additional funds would help temporary relocation of families who are displaced from their primary residences when lead hazard reduction work is being performed.

APPENDICES

A. EPA-Prepared GIS Map of Lead Cases by County Reported in Minnesota

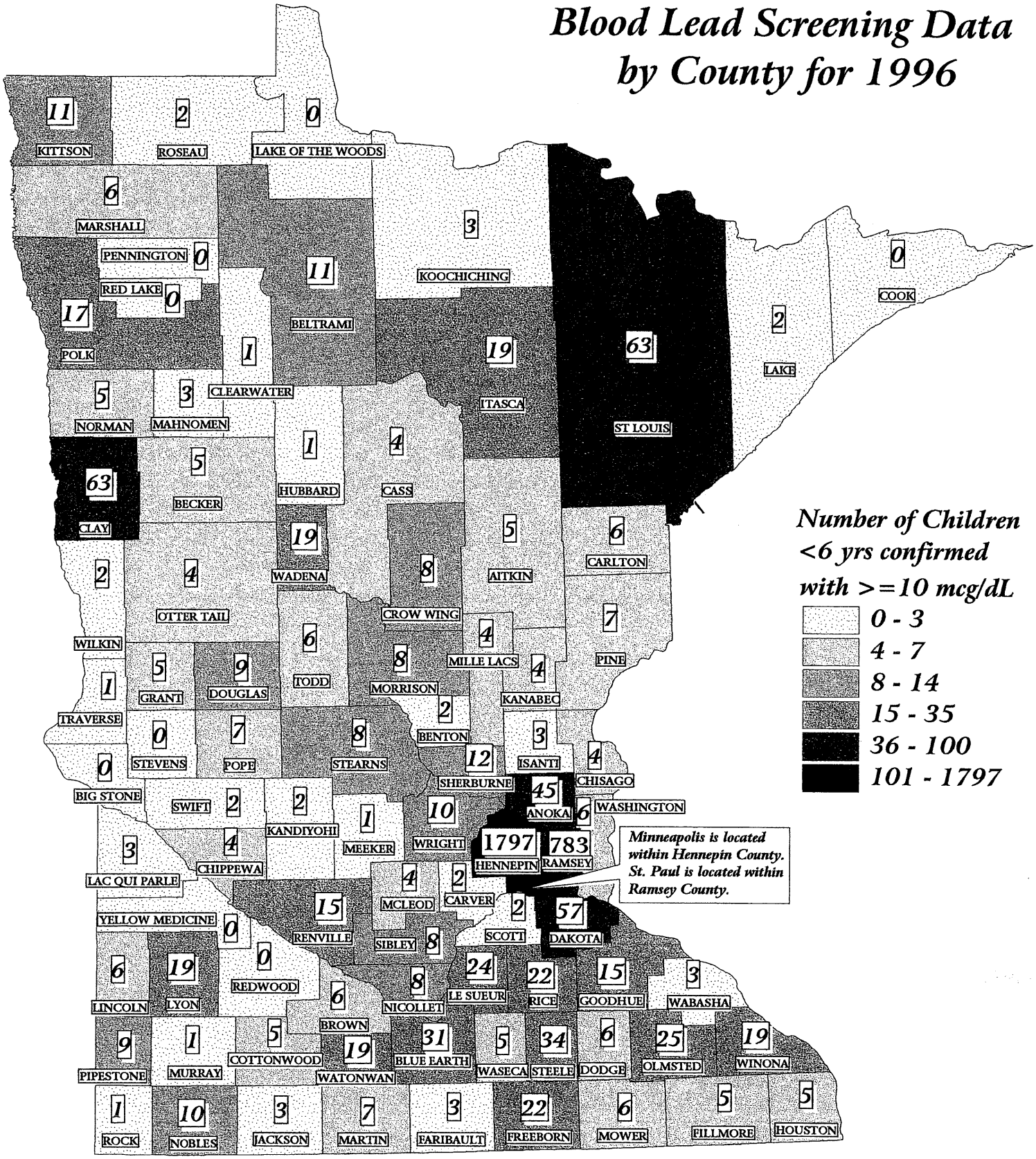
B. Minnesota Blood Lead Surveillance Data, 1997

C. Informational Directive Fact Sheets:
   Maintaining Walls, Floors, and Ceilings to Prevent Exposure to Lead
   Maintaining and Repairing Porches to Prevent Exposure to Lead
   Is Lead a Problem in Your Home? Conducting a Risk Evaluation for Lead
   Prohibited Methods for Removing or Cleaning Up Sources of Lead

APPENDIX A

EPA-Prepared GIS Map of Lead Cases by County Reported in Minnesota

Minnesota Blood Lead Screening Data by County for 1996



Prepared for: EPA

By: Joy C. LeBlang

Source: MN Dept of Health

APPENDIX B

Minnesota Blood Lead Surveillance Data, 1997

Minnesota Blood Lead Surveillance Data, 1997

What is the public health problem?

Lead poisoning is a significant, preventable environmental health problem among children in the United States. Phase 2 of the Third National Health and Nutrition Examination Survey (1991-1994) reported that approximately 4.4 percent of children in the United States aged 1-5 years, representing an estimated 890,000 children, had blood lead levels greater than or equal to 10 micrograms per deciliter (μg/dL), and 0.4 percent had levels equal to or greater than 20 μg/dL. The United States Centers for Disease Control and Prevention (CDC) recommends educational, medical, and/or environmental intervention if blood lead levels measure 10 μg/dL or greater. Lead poisoning can cause learning, behavior, and health problems in young children. In adults, lead can cause high blood pressure, kidney damage, and damage to the reproductive organs. Lead exposure may occur in workplaces that use lead. Lead may be present in homes containing paint manufactured before 1979. Deteriorating paint (chipping, flaking, and peeling) contributes to lead dust, contaminates soil around a home, and makes chips of paint accessible to children. Other exposure pathways include soil and dust; drinking water; "take-home lead" by way of parental occupations and hobbies; air; food; and possibly "traditional" medicines.

How does the MDH address the problem?

The Minnesota Department of Health (MDH) maintains an extensive blood lead surveillance system for the purpose of monitoring trends in blood lead levels in adults and children in Minnesota. The data are used to help identify populations at risk for elevated blood lead levels. The surveillance system is designed 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 is provided to children with elevated blood lead levels. Lead program staff advise local health departments of elevated venous blood lead levels that require follow up. Health care providers and public health agencies educate families of children with blood lead levels of 10 μg/dL or greater about the hazards of lead. Homes of children and pregnant women with venous blood lead levels of 20 μg/dL or greater, or with levels of 15-19 μg/dL that persist for 90 days, are inspected for lead hazards so that homes can be made lead safe and blood lead levels can be reduced.

The type of intervention required is dependent on the blood lead level of the child. Local public health agencies are involved in providing education to families or in performing a home assessment to identify sources of lead exposure. When local public health agencies do not have responsibility for follow up, the MDH conducts the home assessment and lead inspection.

Minnesota Department of Health • Division of Environmental Health • 121 East Seventh Place, P.O. Box 64975, St. Paul, MN 55164-0975

612/215-0700 •TDD 612/215-0707 or 1-800/627-3529

How are the data collected?

The results of the blood analyses and additional demographic and laboratory information are reported to the MDH by approximately 30 independent laboratories and/or hospitals that service approximately 1,000 medical clinics, hospitals, and employer groups. Blood lead results of 15 μg/dL or greater are either faxed or phoned in to staff at the MDH within two days of the laboratory analysis, with written confirmation of the results sent within one month. Results of 14.9 μg/dL or less are either sent through the U.S. mail on paper or diskette, or electronically delivered to the MDH within one month of laboratory analysis.

Continued quality control procedures have reduced errors and increased completeness of the 1997 data set. Missing information on a patient's date of birth, address, and type of test conducted were investigated on all blood lead reports of 10 μg/dL or greater prior to data entry. In addition, the majority of missing county and zip code information was obtained from the world wide web. Each record entered into the database was checked for accuracy by another worker. Studies were conducted examining the completeness of reporting and timeliness of data entry. Information gained from these studies have aided in improving the data collection process.

1997 Data by County

A total of 50,683 blood lead results from 44,877 children and adults with associated demographic information were reported to the MDH in 1997. These tests include patients of all ages and include multiple tests on some patients. Tests are reported for capillary, venous, and unknown types of blood draws.

The results included in this report represent submitted reports of blood lead tests of Minnesota children aged 0-72 months and adults (17 years of age or older) between January 1 and December 31, 1997. Some results of Minnesota patients tested in 1997 may not have been reported to the MDH. The table below shows the numbers of children 0-72 months of age tested in 1997 according to blood lead level, as well as adults with levels of 40 μg/dL or greater. Data for the cases of 15 μg/dL and greater are venous results only. Data for levels of 10-14.9 μg/dL for children and 40 μg/dL or greater for adults include results of venous, capillary, or unknown types of blood draws. It is important to recognize that the data are not representative of all Minnesota children. The data include only children for whom a family member has requested tests or for whom a health care provider has ordered tests. Blood lead testing is not mandatory among children in Minnesota. Some children who are lead poisoned may not have been detected because they have not been tested. These children do not appear in the statistics shown here.

Currently there are no commonly accepted criteria used in Minnesota to determine who should be tested. However, plans are underway to establish screening guidelines based on the Minnesota surveillance data and CDC recommendations. While the CDC recommends that all young children be screened for elevated blood lead, this may not be feasible in some areas of the state. Since not all children residing in each county have been tested, comparison of numbers of children with elevated blood lead levels across counties is not appropriate. Likewise, it is impossible to draw conclusions regarding rates of lead poisoning in Minnesota.

Although rates are not calculable from this surveillance data, it is possible to use the data to identify trends in screening practices from year to year. For example, comparing the number of children tested in 1996 with the number tested in 1997 gives some indication of how screening practices may have changed. Local public health agencies can use this information to assist in making decisions regarding education of the medical community about whether to increase screening and testing of children identified as being at high risk for blood lead poisoning.

Previous research has helped to identify some risk factors for lead exposure. They are as follows:

- Age - from six months to six years due to behavior and physiology
- Race/ethnicity - minorities generally have higher blood lead levels
- Low income - associated with poor housing, diet, health care, and/or education
- Poor nutrition - iron and calcium deficiencies increase lead absorption; fat increases absorption
- Urban residence - more lead sources such as contaminated soils
- Recent or ongoing home remodeling - increases dust and paint flakes in home

Local public health agencies should review risk factors for elevated blood lead and the available blood lead data to assess concerns about elevated blood lead. Factors that should be considered locally are the size of the population; screening practices of the health care providers in the area; the age and condition of housing stock; occupational and community sources of lead; and risk factors in the population. The assessment should address the amount of screening that takes place relative to the size of the population; the number of elevated cases that are found relative to the amount of screening and the size of the population; and the use of other screening tools, such as questionnaires, that rely on identifying risk factors. Caution should be taken when using rates calculated from this data for comparison since there is no universal testing among children and those tested do not represent the entire population.

See the Lead Section of the order form at the end of this document for fact sheets available through the MDH. In particular, see *The Primary Care Provider's Role in Blood Lead Surveillance Reporting* and *Reporting Requirements for Facilities Performing Blood Lead Analyses*. For further information on surveillance for elevated blood lead levels and to request a copy of the 1995-1997 surveillance report, contact the Health Risk Assessment Unit: Marla Husnik, 651/215-0874 or marla.husnik@health.state.mn.us.

These data will appear in the *Minnesota Environmental Health Profile, 1997 Data*, published by the Minnesota Department of Health, Division of Environmental Health in December 1998. Contact the Health Risk Asessment Unit for more information concerning the annual environmental health profile.

Numbers of Patients Tested in 1997 According to Age and Blood Lead Level, in micrograms per deciliter (μg/dL)

County	Children[1,3] 10 to 14.9	Children[1,4] 15 to 19.9	Children[1,4] 20 or greater[4]	Children[1] Total Tested	Adults[2,3] 40 or greater
Aitkin	3	1	1	32	0
Anoka	15	3	4	975	4
Becker	4	0	0	282	0
Beltrami	6	0	0	307	0
Benton	3	0	0	69	0
Big Stone	0	0	0	13	0
Blue Earth	7	4	3	261	0
Brown	5	0	1	100	0
Carlton	0	0	0	158	0
Carver	1	0	1	117	0
Cass	4	0	0	126	0
Chippewa	4	0	0	29	0
Chisago	3	0	0	101	0
Clay	17	0	0	354	0
Clearwater	3	0	0	47	0
Cook	0	0	0	6	0
Cottonwood	3	1	0	81	0
Crow Wing	7	0	0	166	0
Dakota	26	2	3	893	12
Dodge	2	0	0	61	0
Douglas	1	0	0	171	0
Faribault	8	0	0	66	0
Fillmore	4	0	0	103	1
Freeborn	0	0	0	79	0
Goodhue	14	3	0	248	2
Grant	0	0	0	27	0
Hennepin	972	233	231	14,824	6
Houston	1	1	0	112	0
Hubbard	0	0	0	10	0
Isanti	1	0	0	98	1
Itasca	6	0	1	240	0
Jackson	1	0	0	44	0
Kanabec	1	0	0	30	0
Kandiyohi	2	1	0	39	0
Kittson	1	0	0	40	0
Koochiching	2	0	0	16	0
Lac Qui Parle	1	0	0	23	0
Lake	1	0	1	37	0
Lake of the Woods	0	0	0	6	0
Le Sueur	6	1	0	95	0
Lincoln	2	0	0	12	0
Lyon	15	1	0	102	0
McLeod	1	0	1	33	0
Mahnomen	1	0	0	100	0
Marshall	1	1	0	96	0

County	Children[1,3] 10 to 14.9	Children[1,4] 15 to 19.9	Children[1,4] 20 or greater[4]	Children[1] Total Tested	Adults[2,3] 40 or greater
Martin	6	2	1	140	0
Meeker	1	1	0	17	0
Mille Lacs	4	0	0	153	0
Morrison	4	0	0	168	0
Mower	3	0	0	101	0
Murray	2	0	1	48	0
Nicollet	2	2	0	76	0
Nobles	8	1	2	233	0
Norman	1	0	0	43	0
Olmsted	7	4	4	169	0
Otter Tail	3	0	0	121	0
Pennington	0	0	0	20	0
Pine	2	0	0	59	0
Pipestone	1	1	0	96	0
Polk	7	0	0	176	0
Pope	0	0	1	36	0
Ramsey	503	92	91	7,287	24
Red Lake	0	0	0	3	0
Redwood	3	0	0	55	0
Renville	13	2	1	106	0
Rice	4	0	0	205	0
Rock	0	0	0	8	0
Roseau	2	0	0	16	0
St. Louis	26	4	1	1,348	4
Scott	1	1	0	126	0
Sherburne	3	0	0	259	0
Sibley	3	0	0	73	0
Stearns	3	4	0	232	0
Steele	14	2	1	331	0
Stevens	1	0	0	41	0
Swift	3	0	1	42	0
Todd	5	0	1	154	0
Traverse	1	0	0	20	0
Wabasha	0	0	2	29	0
Wadena	6	0	0	221	0
Waseca	4	0	0	93	0
Washington	11	1	0	389	3
Watonwan	12	1	0	114	0
Wilkin	2	0	0	74	0
Winona	18	3	2	245	1
Wright	4	0	1	255	0
Yellow Medicine	1	0	1	26	0
Unknown	34	0	0	3,218	5
Minnesota Totals	1,883	373	358	37,455	63

[1] 0 to 72 months of age
[2] 17 years of age or older
[3] results of venous, capillary, and unknown test types
[4] results of venous tests only

APPENDIX C

Informational Directive Fact Sheets:
(as they appear on the MDH website)

Maintaining Walls, Floors, and Ceilings to Prevent Exposure to Lead

Maintaining and Repairing Porches to Prevent Exposure to Lead

Is Lead a Problem in Your Home? Conducting a Risk Evaluation for Lead

Prohibited Methods for Removing or Cleaning Up Sources of Lead

MINNESOTA MDH Minnesota Department of Health

Maintaining Walls, Floors and Ceilings
. . . To Prevent Exposure to Lead

We welcome your comments and suggestions about this site.
Feedback Page

This fact sheet describes basic maintenance procedures homeowners can use to repair floors, walls and ceilings in homes that may contain lead-based paint. It also covers simple, but effective, cleaning techniques that can be used to protect the people living in the home from being exposed to lead dust. Lead dust is the most common source of lead exposure for young children.

Lead poisoning is a concern for both children and adults - breathing or eating anything that contains too much lead can cause serious health problems. Young children suffering from lead poisoning can experience learning, behavior and health problems. Adults exposed to too much lead can suffer from high blood pressure, kidney damage and fertility problems. The good news is that lead poisoning is preventable.

Could My Home Have a Problem with Lead?

About 75 percent of homes built before 1978 contain some lead-based paint. You should assume that a house painted before 1978 contains some lead-based paint. Older homes

may have many layers of paint, and older underlying layers are more likely to contain lead. Lead-based paint was used on both the inside and outside of buildings -- special areas for concern include floors, walls, ceilings, trim, baseboards, window wells and sills.

These older underlying layers of paint can be disturbed during remodeling, fix-up or repair work. The only way to know for sure if the paint does not contain lead is to have it tested. You can test the paint by using a home test kit which is available at paint and hardware stores, by sending a paint sample to a lab to be analyzed, or by hiring an individual licensed by the Minnesota Department of Health (MDH) to do a lead evaluation of the home. Call the MDH to learn more about how to test old paint, dust, soil and drinking water for lead.

[back to top]

Before You Begin

Before you start to repair the chipped or peeling paint, find out what caused the paint on the floor, wall, or ceiling to chip or peel. Plumbing problems, window condensation, or a leaky roof may cause water damage that can cause paint to chip or peel. Be sure to fix any underlying problems before you begin to remove or cover the old paint. If you have questions about possible structural problems, contact a building professional. Contact your local building inspector to find out if you need a building permit for your project.

It is important to set up the work area properly, so that the home won't be contaminated with lead dust and paint chips. Removing paint can create a lot of lead-contaminated dust that can be harmful to the people working with lead during remodeling or repair work, and the people living in the home. Anyone working with lead during remodeling or repair work can bring lead dust into their home on their hair, body, clothing, and shoes -- and expose their whole family to harmful lead dust.

The first step is to remove everything from the work area -- including furniture -- so these items do not get covered with lead dust. Any items -- such as bookcases or large furniture -- that can't be taken out of the room should be covered with six mil poly plastic sheeting and sealed. You can find six mil poly at most hardware stores. A double layer of three mil poly can be substituted for each layer of six mil poly. The poly will help protect the items from being covered in lead dust.

Next, turn off all air heating, air conditioning and ventilation systems in the home. Use caution when you turn off the heating, so the water pipes do not freeze. Close, cover and seal the registers to prevent lead dust from settling in the ducts. Turn off window unit air conditioners and fans in the work area.

NOTE: If you are using a chemical stripper, make sure doors and windows are open, and the work area is vented to the outside.

To protect the floor from being covered in lead dust, roll out two layers of six mil poly 10 feet in each direction from the work area. If you are working in a large area, cover and seal the entire floor with poly. If the job takes longer than one day, remove the top layer of poly and discard it, along with any debris collected in it at the end of the day. Add a new top layer of poly before you begin work the next day.

Then close, cover and seal any windows and unused doorways in the work area with poly. Cover the doorways you will be using to enter the work areas by hanging two layers of six mil poly over the doorway. Attach the poly to the top of the doorway with duct tape. Use a utility knife to cut a vertical slit in the top piece of the poly to provide access to the work area. Place a plastic runner on floors to protect the floor from being contaminated by lead dust while carrying clean-up materials and demolition debris outside. Use traction guards when placing runners on stairs. Place washable rugs at the entrance of the work area, and make sure people doing the remodeling work remove their shoes or shoe guards before leaving the work area. Use the washable rugs to prevent tracking lead dust into other areas of the home.

[back to top]

On the Job

The methods described in this fact sheet are recommended because they do not create a lot of lead dust. You may need to use a variety of paint removal or enclosure methods when repairing walls, floors, and ceilings.

Be sure to wear a respirator when you are doing any work that creates lead dust. You can buy a respirator at a safety supply store. Be sure to read and follow the manufacturer's instructions regarding the proper use and fit of the respirator. Check with your doctor to make sure you can safely wear a respirator.

The people living in the home, especially young children and women who are pregnant or nursing, should not be in the work area until the work has been completed and cleaned up.

[back to top]

Wet Scraping Paint

Wet scraping paint may be used to remove old paint from walls, floors and ceilings. To avoid a potential shock hazard, do not wet scrape around electrical outlets.

If you are going to be wet scraping paint off of a surface with an outlet, be sure to turn off the electricity at the fuse box before you mist the surface with water. It is important to lightly mist the surface with water before you scrape off the paint. Using the water will help control the lead dust.

Next, use a utility knife to score or cut the paint around the edge of the area to be scraped. Use a utility knife or scraper to remove all the paint within the scored area. Place the scraped material in a garbage bag and seal. Mist the surface again, and lightly sand the edges of the scraped area to remove all loose paint. Clean the scraped area with a trisodium phosphate (TSP) solution of one tablespoon TSP powder to one gallon water, to remove lead dust. Then rinse the scraped area well with clean water. Use two separate buckets, one for the TSP cleaning solution, and one for the clean rinse water. Use two separate sets of disposable rags or paper towels -- one for the washing step and one for the rinse step. Wear waterproof, chemical resistant rubber gloves. Make sure the surface is completely dry before repainting.

Do not dry-sand to remove lead-based paint. Dry-sanding creates a lot of harmful lead dust. The only time it is okay to dry-sand is when you are removing paint from a small area around an electrical outlet.

Do not use a heat gun at temperatures of 700 degrees Fahrenheit or greater to remove lead-based paint. This level of heat will create a dangerous lead fume that is very easy to breathe in.

[back to top]

Using a Paint Stripper

Paint strippers may be used to remove old paint from floors, walls and ceilings.

Some stripper products contain very strong chemicals. Wear a respirator specially designed to protect against chemical vapors when you are working with a chemical stripper. Check with a hardware or safety supply store for more information about respirators.

Read the manufacturer's instructions before you apply the stripper. Be sure to have the doors and windows open for ventilation and the work area vented to the outside of the house. After you have used the stripper to remove the paint, store the stripper and paint residue in a proper container, according to the manufacturer's instructions. Follow the manufacturer's specific clean up instructions for the stripper product you are using. Then continue the general clean up of your area.

It is recommended that you do not use products containing methylene chloride. The U. S. Environmental Protection Agency has classified it as a probable cause of cancer in

humans, based on studies with laboratory animals.

[back to top]

Patching a Wall or Ceiling

Before you begin the work, turn off the electricity from the fuse box. Do not get the electrical outlets wet.

Lightly mist the area to be patched with water and then carefully break off the loose or damaged material. Repair the area with the appropriate patch material, such as drywall or lath base. Screw or nail the patch material in place. Use spackling for smaller areas like nail holes in plaster. To degloss the old paint along the edges of the patched area, follow the cleaning procedures described in the "wet scraping" section of this fact sheet.

After deglossing and rinsing the surface, apply the filler material, and then feather or smooth the material into the surrounding wall. Paint the patched area.

[back to top]

Enclosure

An enclosure may be used to cover old paint on ceilings, walls and floors.

Enclosure means covering the lead-based paint with a solid material -- such as drywall, tile or paneling -- to create a dust-tight barrier. Some lead-based paint will probably still remain behind the enclosure. Wallpaper and new paint are not enclosure materials. Do not paint over chipping or peeling paint -- the new paint will simply chip off with the old.

You should safely remove all of the chipping and peeling paint before you enclose the surface. Refer to the "wet scraping" section for instructions on how to remove the paint safely. Repair the surface as needed and then label it "MAY CONTAIN LEAD- BASED PAINT" before you enclose the area. Talk to hardware store staff or a licensed remodeler for recommendations for the best enclosure materials to use in your job. Regularly check the enclosure for damage or wear.

[back to top]

Liquid Encapsulants

Liquid encapsulants may be used on walls, floors, ceilings and trim. Liquid encapsulants are not recommended for use on doors and windows. Encapsulant use is regulated by the MDH. If you want to use an encapsulant, call MDH at (651) 215-0909 to learn more.

Liquid encapsulants are designed to be a long-lasting material that covers the lead-based paint and forms a durable bond with the surface. These encapsulants may look like paint and be applied like paint, but are chemically different than paint. Regular household paint is not an encapsulant. You will need to follow the manufacturer's directions for preparing the surface before applying the liquid encapsulant.

[back to top]

Special Tips for Working on Floors

Floors are often covered with lead dust. This dust can come off of chipping paint on the walls, windows, ceilings and then fall to the floor. Lead-contaminated soil and dust can also be tracked in from outside. The lead dust from floors can get onto children's hands, toys, and pacifiers--and then into their mouths.

When doing a repair or clean up job, the floor should always be done last. That way, you'll be able to take care of the dust that has collected on the floor.

Never install wall-to-wall carpeting in a room that has chipping or peeling paint. It is very difficult to remove lead dust from carpeting -- and often the only solution is to remove the contaminated carpet. The best solution for this problem is to create a smooth, sturdy floor that is easy to damp mop or wet wash. For more information, refer to the MDH fact sheet "Safely Working With Lead While Remodeling the Older Home: Removing Carpet."

[back to top]

Clean-up

It's important to clean up the work area each day. Cleaning up paint chips, dust and debris will help protect the people working with lead during the remodeling or repair work, and the people living in the home from being exposed to lead. Anyone working with lead can bring the lead dust home to their families on their hair, skin, shoes and clothing.

Place the rags, paper towels, and mops used during the job and clean up, and the disposable non-washable clothing and shoe covers in a heavy duty garbage bag and seal. Dispose of this debris in the top layer of the poly. Roll up both layers of poly used to catch the debris and paint chips. Start at the corner and roll the material inward to capture all of the dust and debris, and tape the poly shut with duct tape.

Clean the work area throughly, using a High Efficiency Particulate Air Filter (HEPA) vacuum or a wet/dry vacuum. The HEPA vacuum has a special filter that picks up and holds very small pieces of lead dust. The MDH can provide advice on where to find a HEPA vacuum. You'll be given instructions for using the HEPA vacuum when you pick it up.

If you use a wet/dry vacuum, be sure to keep about two inches of water in the bottom of the canister. The water will help to hold the lead dust. The wet/dry vacuum should be used only to vacuum up the wash or rinse water --NOT to pick up dry dust and paint chips.

Do not use your household vacuum to clean up lead dust and paint chips. The filter in the household vacuum is not designed to pick up and hold the fine lead dust -- it will just spread the lead dust throughout the house. Once the source of lead has been cleaned up, it is fine to use your household vacuum cleaner for regular cleaning.

Next, wet wash the entire work area with a cleaning solution made up of trisodium phosphate (TSP) powder or automatic dishwashing detergent with phosphate. You can buy TSP at a hardware store. Make the cleaning solution by mixing one tablespoon of TSP, or one tablespoon of automatic dishwashing detergent, with one gallon of water. If you cannot find TSP or automatic dishwashing detergent that contains phosphate, use a household detergent. If you are using a household detergent to make the cleaning solution, mix the detergent according to the directions on the container. Be sure to wear waterproof, chemical resistant rubber gloves as you wet wash the porch. Daily wet washing will remove harmful lead dust while you complete the remodeling project.

After you wash the area with the cleaning solution, rinse the area with clean water. Be sure to use two separate buckets, one for the cleaning solution, and one for the clean rinse water. Use two separate sets of disposable rags or paper towels --one for the washing step and one for the rinse step. Wear waterproof, chemical resistant rubber gloves. After you finish, filter the rinse water through a five micron filter to catch any large pieces of lead debris. These filters are available at building supply stores. If you can't find one, filter the water through a nylon stocking. Let the lead debris in the filter or stocking dry out, and dispose of it as household hazardous waste.

Put the rags, paper towels, and mops used during the clean up in a garbage bag and seal. Then vacuum the work area again with the HEPA vacuum or wet/dry vacuum. Wait one hour and repeat the clean up process. This will allow for the clean up of any lead dust that may have settled.

[back to top]

Disposal

If you have been remodeling or repairing a home built before 1978, the paint chips, dust

and debris may contain lead. The person who creates the lead waste is legally responsible for its disposal. Minnesota law requires contractors to properly dispose of lead-contaminated waste. Contractors cannot leave lead-contaminated materials with the homeowner for disposal.

Contractors should call the Minnesota Pollution Control Agency (MPCA) at (651) 976-6300, or (800) 657-3864 for information about the clean up and disposal of lead-contaminated waste.

Minnesota law allows property owners to put lead waste in the trash. However, there are a few things to consider. Does your county burn trash after pick-up ? If so, lead fumes may be released into the air. Call your county offices to find out if they burn trash. If your trash is burned, the MDH recommends that you dispose of lead paint chips and lead debris at a household hazardous waste collection site. Call your county offices for information about the household hazardous waste service in your community.

Keep all waste out of the reach of children and pets until pick-up or disposal. Drop cloths, paper towels, gloves and disposable non-washable work clothes used during remodeling and clean-up should be sealed in heavy duty garbage bags. These materials may be covered with lead paint dust and chips. If your county burns trash, these materials should be taken to a mixed municipal solid waste landfill for disposal.

[back to top]

Tools and Materials You Will Need

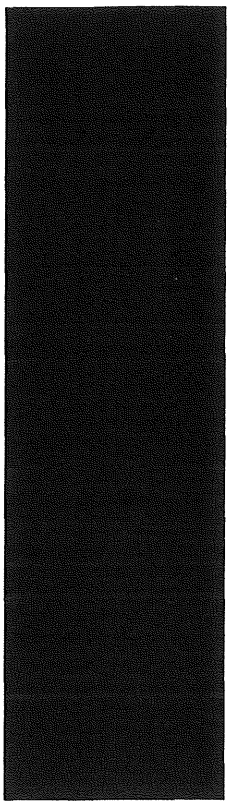
- A High Efficiency Particulate Air (HEPA) Filter vacuum if available, or a wet/dry vacuum to pick up wash or rinse water from the floor.
- Respirator.
- TSP or automatic dishwashing detergent containing phosphate. Use 1 tablespoon of cleaner to 1 gallon water. If using a household detergent, mix the detergent according to the directions on the container.
- Waterproof, chemical resistant rubber gloves.
- A spray bottle with water.
- Buckets.
- Lint-free towels, rags, paper towels and mops you can throw away.
- 6 mil polyethylene plastic sheeting (poly).
- Duct tape for sealing poly and garbage bags.
- Canvas or poly tarps.
- Washable or disposable work clothing.
- Sharp utility knife.
- Common hardware tools in good condition.
- Scraper.
- Wire brush.

[back to top]

Safety Tips

- Use caution with sharp tools.
- Be aware of slip, trip, fall and electrical hazards.
- Wear chemical resistant eye protection when using chemical strippers.
- Wear protective clothing including shoe covers, safety glasses, coveralls, hat or head cover and gloves.
- If you have a HEPA vacuum, use it to clean your work clothes before changing.
- Clean washable work clothing separately from other clothing. Run the rinse cycle once before using the washer again.
- Take off shoe covers before leaving the work area.
- Shower and wash hair immediately after completing the work.
- Protect yourself from eating or breathing in lead. Do not smoke, eat or drink on the job.
- Wash your hands well before smoking, eating, or drinking.
- Keep people and pets out of the work area until clean-up is complete.

[back to top]



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Updated Friday, 18-Dec-98 13:08:51

MDH Minnesota Department of Health

Prohibited Practices...

For Removing or Cleaning Up Sources of Lead

We welcome your comments and suggestions about this site.
Feedback Page

Some methods of paint removal are prohibited because they create lead dust, and other hazardous lead-containing materials, that can be harmful to anyone doing lead hazard reduction work, and the people living in the home. Lead dust is the most common source of lead exposure for young children.

Lead poisoning is a concern for both children and adults - breathing or eating anything that contains too much lead can cause serious health problems. Young children suffering from lead poisoning can experience learning, behavior and health problems. Adults exposed to too much lead can suffer from high blood pressure, kidney damage, and fertility problems. The good news is that lead poisoning is preventable.

Lead Hazard Reduction

Under Minnesota law, certain methods cannot be used to remove lead-based paint in homes - whether the work is being done voluntarily, or under a lead hazard reduction order. This fact sheet describes the paint removal methods prohibited by law during both voluntary residential lead hazard reduction and ordered lead hazard reduction.

Lead hazard reduction is the process of removing or cleaning up the sources of lead. The goal of lead hazard reduction is to make the home safer for the family to live in.

The Minnesota Department of Health (MDH) regulates all residential voluntary lead hazard reduction work in the state. The MDH, and some local health departments, have the authority to issue a lead hazard reduction order. The Minnesota Statutes, sections 144.9501 - 144.9511 and Minnesota Rules, parts 4761.1000 - 4761.1230 describe the specific procedures that must be followed in all phases of residential lead hazard reduction work done voluntarily or under lead hazard reduction orders. The information in this fact sheet is not intended to replace the information in the lead hazard reduction orders, or the statutes or rules governing lead hazard reduction.

What are lead hazard reduction orders?

When a young child or pregnant woman is identified with lead poisoning, the MDH or the local health department will do a lead risk assessment of the home. This lead risk assessment of the home is required by law. During the lead risk assessment, a risk assessor licensed by the MDH will take samples of paint, dust, soil and possibly drinking water. The purpose of the lead risk assessment is to find the sources of lead that are causing the problem.

If any of the samples contain more lead than is allowed under state law, a lead hazard reduction order will be issued against the property. The lead hazard reduction order

identifies the problem areas in the home, and describes options for how the lead hazard reduction work may be done.

The lead hazard reduction orders are enforceable by law, and it is the responsibility of the property owner to comply with the terms of the lead order. The work must be done by the property owner or by a person who is trained to do lead hazard reduction work, and is licensed by the MDH.

[back to top]

Removing Lead-based Paint

When removing lead-based paint, it is important to use methods that create a minimal amount of lead dust and other hazardous materials. If lead-based paint is not removed safely, the people doing the lead hazard reduction work and the people living in the property can be exposed to harmful amounts of lead.

The people living in the home, especially young children and women who are pregnant or nursing, should not be in the work area until the lead hazard reduction work has been completed and cleaned up.

Whether you are doing voluntary or legally-ordered lead hazard reduction work, state law prohibits the use of the following paint-removal methods:

Do not... use an open-flame torch, or a heat gun at temperatures greater than 700 degrees Fahrenheit. An open flame torch can start a fire, and levels of heat above 700 degrees Fahrenheit can create a lead fume that can be breathed in.

Instead... use an adjustable heat gun, and adjust the heat gun to produce a temperature less than 700 degrees Fahrenheit. These temperatures will not produce harmful lead fumes. Use a heat gun to soften the paint, and then remove it with a scraper. Be sure to follow all the safety instructions provided by the manufacturer.

Do not... use chemical strippers containing methylene chloride. The U.S. Environmental Protection Agency has classified methylene chloride as a probable cause of cancer in humans, based on studies with laboratory animals.

Instead... ask your favorite retailer to recommend a paint stripper that does not contain methylene chloride. Be sure to follow the manufacturer's directions for use and safety precautions.

Do not... use power sanders or other powered machines to remove lead-based paint. Power sanders and other powered machines create a large amount of hazardous lead dust.

Exception... Power sanders and other power tools can only be used if they are fitted with a special high efficiency particulate air filter (HEPA) vacuum attachment. The HEPA filter is able to pick up and hold very small pieces of lead dust, protecting the people working with lead, and people living in the home from being exposed to lead dust. Contact a safety supply store for more information about the HEPA vac attachment.

Do not... try to remove lead-based paint by dry scraping, dry-sanding, or dry wire brushing. These methods can produce large amounts of hazardous lead dust. The only time it is appropriate to use these methods for removing lead paint is when you are working on the small areas around electrical outlets and other electrical fixtures.

Instead... use a light mist of water from a spray bottle to dampen the surface, and then use a hook scraper or wire brush to remove the paint. This method helps you control the lead dust, and makes clean up easier. To avoid a potential safety hazard, DO NOT use this method if you are working around electrical outlets or other electrical fixtures.

[back to top]

Removal of Paint Using Interior Abrasives, Water Blasting or Modified Wet Abrasive

Blasting

Interior abrasive blasting and modified-wet abrasive blasting are allowed only on metal building components - such as radiators - and only if the components are enclosed during the blasting process.

Interior water blasting is prohibited except in masonry or stone basements. Exterior water blasting is allowed only if steps are taken to prevent water and debris from leaving the property.

The Minnesota Pollution Control Agency (MPCA) has rules that describe the methods, containment and clean up procedures that must be used during residential abrasive blasting, modified-wet abrasive blasting and vacuum blasting. To order a free copy of these rules, call MPCA at 651-296-6300 or 800-657-3864.

Lead-contaminated Bare Soil

The soil near busy streets or roadways sometimes may be contaminated with lead. During the years when lead was used in gasoline, the exhaust from cars and trucks would release small particles of lead into the air, and this lead fell into the soil. The lead stays in the soil. People can be exposed to lead if this lead-contaminated soil is tracked into the house by family members or pets.

The method you use to deal with lead-contaminated soil will differ based on the amount of lead in the soil. Refer to Minnesota Rules, parts 4761.1000 - 4761.1230 for the appropriate intervention as required by law.

Tips for Wet Cleaning

Use a high efficiency particulate air filter (HEPA) vacuum cleaner during the clean up. The HEPA vac has a special filter that will pick up and hold the small pieces of lead dust. Don't use your household vacuum to clean up sources of lead - the filter is not designed to pick up and hold the lead. If you don't have access to a HEPA vac, use a wet/dry vac to pick up the wash and rinse water. Do not use the wet/dry vac to vacuum dry areas.

Wet wash the work areas, using a cleaning solution made of one tablespoon trisodium phosphate (TSP) - or one tablespoon of automatic dishwashing powder containing phosphate- to one gallon of water. If you can't find TSP or automatic dishwashing powder, use a household detergent to make the cleaning solution. Mix the household detergent according to the directions on the container. Follow up the wet washing with a clean water rinse. Use two separate buckets, one for the cleaning solution, and one bucket for the rinse water. Use two separate sets of disposable rags or paper towels - one for the washing step and one for the rinse step. Wear chemical resistant rubber gloves when you do the wet washing.

Do not dry sweep dust, lead-contaminated debris, or anything else that may contain lead. Dry sweeping will stir up hazardous lead dust.

[back to top]

Disposal of Lead-Contaminated Waste

Lead-contaminated waste is created during lead hazard reduction work. Paint chips, clean-up debris, and bulk materials-such as door frames, windows, and carpet - are examples of lead-contaminated waste. The person who creates the waste is responsible for its disposal. Minnesota law requires contractors to properly dispose of lead-contaminated waste. Contractors cannot leave the lead-contaminated waste with the homeowner for disposal. Contractors should call the Minnesota Pollution Control Agency (MPCA) at 651-296-6300 or 800-657-3864 for more information about the clean-up and disposal of lead-contaminated waste.

Minnesota law allows homeowners to put lead waste in the trash. However, there are a few things to consider. Does your county burn trash after pick-up? If so, lead fumes may be released into the air. Call your county offices to find out if they burn trash. If your trash is burned, the MDH recommends that you dispose of lead paint chips and lead debris at a

household hazardous waste collection site. Call your county offices for more information.

Minnesota statutes and rules describe the specific procedures that must be used to set up, perform, and clean up a voluntary or ordered lead hazard reduction project. To request a copy of the statutes and rules dealing with lead, and a list of licensed people trained to work with lead, call the MDH at 651-215-0909.

If you are doing the lead hazard reduction work as employment, you must follow the Minnesota Occupational Safety and Health Administration (OSHA) requirements for respiratory and other personal protective gear. For more information call Minnesota OSHA at 651-296-2116.

[back to top]

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Updated Wednesday, 16-Dec-98 16:01:50

MDH Minnesota Department of Health

Maintaining and Repairing Porches...

To Prevent Exposure to Lead

We welcome your comments and suggestions about this site.
Feedback Page

This fact sheet describes basic maintenance procedures homeowners can use to repair porches that may be covered with lead-based paint. It also covers simple, but effective, cleaning techniques that can be used to protect the people living in the home from being exposed to lead dust. Lead dust is the most common source of lead exposure for young children.

Lead poisoning is a concern for both children and adults - breathing or eating anything that contains too much lead can cause serious health problems. Young children suffering from lead poisoning can experience learning, behavior and health problems. Adults exposed to too much lead can suffer from high blood pressure, kidney damage and fertility problems. The good news is that lead poisoning is preventable.

Could My Home Have a Problem With Lead?

About 75 percent of homes built before 1978 contain some lead-based paint. You should assume that a house painted before 1978 contains some lead-based paint. Older homes may have many layers of paint, and the older underlying layers are more likely to contain

lead.

Lead-based paint used on porches can be a special concern. Porches are exposed to extreme hot, cold, rain and snow - which can result in chipping, peeling and flaking of the paint. The deteriorating paint then falls into the soil around the base of the home, and the lead-contaminated paint chips, dust and soil can be tracked into the home.

The older layers of paint can be disturbed when a porch is being repaired or remodeled. The only way to know if the paint does not contain lead is to have it tested. You can test the paint by using a home test kit which is available at paint and hardware stores, by sending a paint sample to a lab to be analyzed, or hiring an individual licensed by the Minnesota Department of Health (MDH) to do a lead evaluation of the home. Call MDH to learn more about how to test old paint, dust, soil and drinking water for lead.

[back to top]

Before You Begin

Before you begin repairing the porch, take a look around the work area to find out what caused the paint to chip or peel. The problem could be water damage from a leaky roof or gutter, rodent damage, or insect infestation. Be sure to fix any underlying problems before you remove or cover the old paint. If you have questions about the possible structural problems with the porch, contact a building professional. Contact your local building inspector to find out if you need a building permit for your project.

Be sure to set up your work area properly, so that your home and yard won't be contaminated with lead dust and paint chips. Repairing a porch can create a lot of lead-contaminated dust that can be harmful to the people doing the work, and the people living in the home.

The first step is to remove everything from the porch - including toys and furniture - so they won't be contaminated with lead dust. Any large items that cannot be taken out of the porch should be covered with 6 mil poly plastic sheeting and sealed. Then roll out two layers of 6 mil poly, 10 feet in all directions from the work area. If you are working in a large area, cover and seal the entire floor with poly. If the job takes longer than one day, remove the top layer of poly and discard it, along with any debris collected in it at the end of the day. Add a new top layer of of poly before you begin work the next day.

Then turn off all of the air heating, air conditioning and ventilation systems in the home. Cover and seal openings on the outside of the building that might provide a way for lead dust and paint chips to get into the home. These openings include the clothes dryer exhaust vent, exterior air conditioning units, and all the fresh air intakes for the furnace, fireplace, wood-burning stove, or other combustion appliances. DO NOT use the appliances while these openings are covered and sealed. Remember to uncover these fresh air intakes when the job is finished. Be sure to let neighbors on either side of the home know about the repair work in advance, so they will have time to take precautions that will prevent lead dust from getting into their homes.

Next turn off the window air conditioning units and fans in the work area. Cover both the inside and outside of window units with 6 mil poly plastic sheeting and seal. You can find 6 mil poly at most hardware stores. A double layer of 3 mil poly plastic sheeting can be substituted for each layer of 6 mil poly. Tape the poly to the foundation of the house with duct tape. Then cover and seal all windows in the work area so lead dust won't get caught in the screens. Remove the screens if your exterior work includes the windows. Cover and seal the windows from the inside so lead dust won't get into the home. Finally, cover and seal any doorways in the work area that are not being used. Place washable rugs at all entrances so that lead dust isn't tracked into the home. Wash the rugs separately from other items. Run the rinse cycle once before using the washer again.

It is also important to cover the soil around the base of the home, so it won't be contaminated with lead. Place one layer of 6 mil poly around the foundation of the building, extending outward from the base of the building to a distance of 10 feet or to the property line. If the building is more than one story tall, extend the layer of 6 mil poly to a distance of 20 feet or to the property line - whichever point is reached first. Also be sure to cover all sandboxes, swing sets, play areas and gardens before you start the work. If you are using a ladder, place a sturdy piece of plywood under the ladder so it won't cut through the poly. The plywood will also provide a stable base for the ladder to prevent tipping. If the job lasts

more than one day, remove the top layer of poly and discard it, along with any debris collected in it at the end of the day. Put down a new top layer of poly before you begin work the next day.

[back to top]

On the Job

The methods described in this fact sheet are recommended because they do not create a lot of lead dust. You may need to use a variety of paint removal or enclosure methods when repairing a porch.

Be sure to wear a respirator when you are doing any work that creates lead dust. You can but a respirator at a safety supply store. Be sure to read and follow the manufacturer's instructions regarding the proper use and fit of the respirator. Check with your doctor to make sure you can safely wear a respirator.

The people living in the home, especially young children and women who are pregnant or nursing, should not be in the work area until the work has been completed and cleaned up.

[back to top]

Wet Scraping Paint

Scraping paint may be used to remove old paint from porch ceilings, floors, rails, and columns. To avoid a potential shock hazard, do not wet scrape around electrical outlets.

If you are going to be wet scraping paint off of a surface with an outlet, be sure to turn off the electricity at the fuse box before you mist the surface with water. It is important to lightly mist the surface with water before you scrape off the paint. Using the water will help control the lead dust.

Next use a utility knife to score or cut the paint around the edge of the area to be scraped. Use a utility knife or scraper to remove all the paint within the scored area. Place the scraped material in a garbage bag and seal. Mist the surface again, and lightly sand the edges of the scraped area to remove all the loose paint. Clean the scraped area with trisodium phosphate (TSP) solution of 1 tablespoon TSP powder to 1 gallon water, to remove lead dust. Use two separate buckets, one for the TSP cleaning solution, and one for the clean rinse water. Use two separate sets of disposable rags, or paper towels - one for the washing step and one for the rinse step. Wear waterproof, chemical resistant gloves. Make sure the surface is completely dry before repainting.

Do not dry-sand to remove lead-based paint. Dry-sanding creates a lot of harmful lead dust. The only time it is okay to dry sand is when you are removing paint from a small area around an electrical outlet.

Do not use a heat gun at temperatures of 700 degrees Fahrenheit or greater, to remove lead-based paint. This level of heat will create a dangerous lead fume that is very easy to breathe in.

[back to top]

Using a Paint Stripper

Paint strippers may be used to remove old paint from porch floors, balusters, rails, and columns.

Some stripper products contain very strong chemicals. Wear a respirator specially designed to protect against chemical vapors when you are working with a chemical stripper. Check with a hardware or safety supply store for more information about respirators.

Read the manufacturer's instructions before you apply the stripper. If you are working on

an enclosed porch, be sure to have the doors and windows open for ventilation and the work area vented to the outside of the house. After you have used the stripper to remove the paint, store the stripper and paint residue in a proper container, according to the manufacturer's instructions. Follow the manufacturer's specific clean-up instructions for the stripper product you are using. Then continue the general clean-up of your area.

It is recommended that you do not use products containing methylene chloride. The U.S. Environmental Protection Agency has classified it as a probable cause of cancer in humans, based on studies with laboratory animals.

[back to top]

Enclosure

An enclosure may be used to cover old paint on walls, ceilings, and floors.

Enclosure means covering the lead-based paint with a solid material - such as drywall, tile or paneling - to create a dust-tight barrier. Some lead-based paint will probably still remain behind the enclosure. Wallpaper and new paint are not enclosure materials. Do not paint over chipping or peeling paint - the new paint will simply chip off with the old.

You should safely remove all of the chipping and peeling paint before you enclose the surface. Refer to the "wet scraping" section for instructions on how to remove the paint safely. Repair the surface as needed and then label it "MAY CONTAIN LEAD-BASED PAINT" before you enclose the area. If you are selecting an enclosure material for an exterior porch, be sure to use weather resistant material that is suitable for an outside porch. Regularly check the enclosure for any damage or wear.

[back to top]

Liquid Encapsulants

Liquid encapsulants may be used to seal porch walls, balusters and columns. Encapsulant use is regulated by the MDH. If you want to use an encapsulant, call the MDH at (651) 215-0909 to learn more.

Liquid encapsulants are designed to be a long-lasting material that covers the lead-based paint and forms a durable bond with the surface. There are different types of liquid encapsulants. These encapsulants may look like paint and be applied like paint, but are chemically different than paint. Regular household paint is not an encapsulant. You will need to follow the manufacturer's directions for preparing the surface before applying the liquid encapsulant.

[back to top]

Replacement

Sometimes the porch components are heavily damaged and need to be replaced. The lattice, rails and floors are especially likely to require complete replacement. If you are replacing the floor of an exterior porch, be sure to make the floor slope down so that water will drain off of the porch. If there is severe damage, you may need to hire a carpenter to rebuild the porch.

When you replace porch components, be sure to use exterior grade construction materials. Once you install the new components, talk to your local paint store about the best type of coatings to use on the new floor, wall or ceiling.

Wait until you've completed the rest of the job to work on the floor - otherwise, the lead dust from other phases of the project will recontaminate the floor.

[back to top]

Clean-up

It's important to clean-up the work area each day. Cleaning up paint chips, dust and debris will help protect the person doing the repair work, and the people living in the home, from being exposed to lead. Anyone working with lead during remodeling or repair work can bring the lead dust home to their families on their hair, skin and clothing.

Place the rags and paper towels used during the job and clean up, and the disposable, non-washable clothing and shoe covers in a heavy duty garbage bag and seal. Dispose of this debris in the top layer of the poly. Roll up all the poly used to catch the debris and paint chips. Start at the corner and roll the material inward to capture all the dust and debris, and tape the poly shut with duct tape.

Clean the work area thoroughly, using a High Efficiency Particulate Air Filter (HEPA) vacuum or wet/dry vacuum. The HEPA vacuum has a special filter that picks up and holds very small pieces of lead dust. The MDH can provide advice on where to find a HEPA vacuum. You'll be given instructions for using the HEPA vacuum when you pick it up.

If you use a wet/dry vacuum, be sure to keep about 2 inches of water in the bottom of the canister. The water will help to hold the lead dust. The wet/dry vacuum should be used only to vacuum up the wash or rinse water - NOT to pick up dry dust and paint chips.

Do not use your household vacuum to clean-up lead paint dust and chips. The filter in the household vacuum is not designed to pick up and hold fine lead dust - it will just spread the lead dust throughout the house. Once the source of lead has been cleaned up, it is fine to use your household vacuum cleaner for regular cleaning.

Next, wet sweep or wet wash the porch and patio with a cleaning solution made up of trisodium phosphate (TSP) powder or automatic dishwashing detergent with phosphate. You can buy TSP at a hardware store. Make the cleaning solution by mixing one tablespoon of dry TSP powder, or one tablespoon of automatic dishwashing detergent, with one gallon of water. If you cannot find TSP or automatic dishwashing detergent that contains phosphate, use a household detergent.

If you are using a household detergent to make the cleaning solution, mix the cleaning solution according to the directions on the container. Be sure to wear waterproof, chemical resistant rubber gloves as you wet wash the porch. Daily wet washing will remove harmful lead dust while you complete the remodeling project.

After you wash the area with the cleaning solution, rinse the area with clean water. Be sure to use two separate buckets - one bucket for the cleaning solution, and one bucket for the clean rinse water. Use separate sets of disposable rags or paper towels - one set for the washing step and one set for the rinse step. After you finish, filter the rinse water through a 5 micron filter to catch any large pieces of lead debris. These filters are available at building supply stores. If you can't find one, filter the water through a nylon stocking. Let the lead debris in the filter or stocking dry out, and dispose of it as household hazardous waste.

Put the additional rags, paper towels, and mops used during the clean up in a garbage bag and seal. Then vacuum the work area again with the HEPA vacuum or wet/dry vacuum. Wait one hour and repeat the clean-up process. Finish up by raking up any large paint chips or small debris that may have fallen into the grass and soil around your home.

[back to top]

Disposal

If you have been remodeling or repairing a home built before 1978, the paint chips, dust and debris may contain lead. The person who creates the lead waste is legally responsible for its disposal. Minnesota law requires contractors to properly dispose of lead-contaminated waste. Contractors cannot leave lead-contaminated materials with the homeowner for disposal. Contractors should call the Minnesota Pollution Control Agency (MPCA) at 651-296-6300, or (800) 657-3864 for information about the clean-up and disposal of lead-contaminated waste.

Minnesota law allows property owners to put lead waste in the trash. However, there are a few things to consider. Does your county burn trash after pick-up? If so, lead fumes may

be released into the air. Call your county offices to find out if they burn trash. If your trash is burned, the MDH recommends that you dispose of lead paint chips and lead debris at a household hazardous waste collection site. Call your county offices for information about the household hazardous waste service in your community.

Keep all waste out of the reach of children and pets until pick-up or disposal. Drop cloths, paper towels, gloves, and disposable, non-washable work clothes used during remodeling and clean-up should be sealed in heavy duty garbage bags. These materials may be covered with lead paint dust and chips. If your county burns trash, these materials should be taken to a mixed municipal solid waste landfill for disposal.

Larger pieces of demolition debris, such as doors and window frames, should be wrapped in two layers of 6 mil poly and sealed with duct tape. If your county burns trash, or your garbage hauler will not accept these large pieces, they can be taken to a mixed municipal solid waste landfill, or a demolition debris landfill, for disposal. Call the MPCA at (651) 296-6300, or (800) 657-3864 to find out where these collection sites are located. Contact your local garbage hauler to find out which materials they will pick-up with your trash.

[back to top]

Tools and Materials You Will Need

- A High Efficiency Particulate Air (HEPA) Filter vacuum if available, or a wet/dry vacuum to pick up wash or rinse water from the floor.
- Respirator.
- TSP or automatic dishwashing detergent containing phosphate. Use 1 tablespoon of cleaner to 1 gallon water. If using a household detergent, mix the detergent according to the directions on the container.
- Waterproof, chemical resistant rubber gloves.
- A spray bottle with water.
- Buckets.
- Lint-free towels, rags, paper towels and mops you can throw away.
- 6 mil polyethylene plastic sheeting (poly).
- Duct tape for sealing poly and garbage bags.
- Canvas or poly tarps.
- Washable or disposable work clothing.
- Sharp utility knife.
- Common hardware tools in good condition.
- Scraper.
- Wire brush.

[back to top]

Safety Tips

- Use caution with sharp tools.
- Be aware of slip, trip, fall and electrical hazards.
- Wear chemical resistant eye protection when using chemical strippers.
- Wear protective clothing including shoe covers, safety glasses, coveralls, hat or head cover and gloves.
- If you have a HEPA vacuum, use it to clean your work clothes before changing.
- Clean washable work clothing separately from other clothing. Run the rinse cycle once before using the washer again.
- Take off shoe covers before leaving the work area.
- Shower and wash hair immediately after completing the work.
- Protect yourself from eating or breathing in lead. Do not smoke, eat or drink on the job.
- Wash your hands well before smoking, eating, or drinking.
- Keep people and pets out of the work area until clean-up is complete.

[back to top]

12/98 IC# 141-0671

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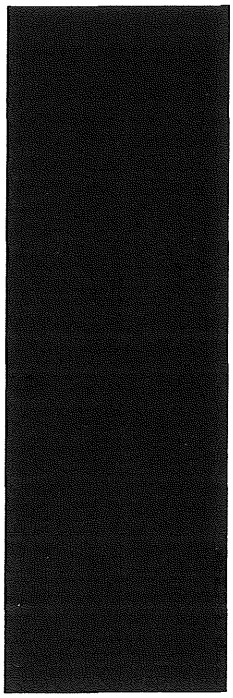

Minnesota Department of Health Lead Program
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Updated Friday, 18-Dec-98 13:08:08

MINNESOTA MDH Minnesota Department of Health

Is Lead A Problem in Your Home?
Conducting a Risk Evaluation for Lead

Does your home contain lead? Old deteriorating paint, the dust that comes off of chipping or peeling paint, bare soil, dust, and drinking water are common sources of lead found in and around older buildings. However, just because there is lead present in the home does not necessarily mean there is cause for concern.

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This fact sheet describes some of the most common conditions to look for when identifying sources of lead that may be a problem in residential property. The information in this fact sheet does not replace a lead evaluation conducted by a lead professional licensed by the Minnesota Department of Health (MDH).

Lead poisoning is a concern for both children and adults - breathing or eating anything that contains too much lead can cause serious health problems. Young children suffering from lead poisoning can experience learning, behavior and health problems. Adults exposed to too much lead can suffer from high blood pressure, kidney damage, and fertility problems. The good news is that lead poisoning is preventable.

Lead in Paint

Lead in Dust

Lead in Soil

Lead in Drinking Water

Lead in Paint

About 75 percent of homes built before 1978 contain some lead-based paint. So, you should assume that a house painted before 1978 contains some lead-based paint. The only way to know for sure if the paint does not contain lead is to have it tested. To learn more about testing paint, dust, soil and drinking water for lead call the MDH. Older homes may have many layers of paint, and the older layers are more likely to contain lead. Lead-based paint was used on the inside and outside of buildings, as well as on window wells and sills, walls, trim, cabinets, radiators and floors.

Lead-based paint is not dangerous as long as it remains intact, and is not rubbed, bumped or damaged. To identify possible problem areas in your home:

Look for chipping, peeling and deteriorating paint on fences, porches, the exterior of the house, and other buildings on the property. Pay special attention to windows and doors - the repeated motion of opening and closing windows and doors can damage paint, creating lead paint chips and dust.

Examine swing sets and other play equipment. Some swing sets and other play equipment may be covered with chipping or flaking lead-based paint.

Check the condition of old wallpaper - it may have been made with dyes that contain lead.

Look for chipping, peeling and deteriorating paint inside the home, especially on window wells and sills, doors, trim, baseboards, railings, walls, floors and ceilings. Pay special attention to window wells and sills, and doors - these areas often contain deteriorating lead-based paint and lead dust.

Lead-based paint also may have been used on old toys and furniture - check the condition of the paint on these items.

Check the condition of radiators and other painted surfaces in bathrooms. Inadequate ventilation and continuous exposure to moisture can cause paint to chip, peel or flake.

[back to top]

Lead in Dust

Lead dust is the most common source of lead exposure in young children. Lead dust can chalk off of deteriorating lead-based paint, and can also be found in lead-contaminated soil. People working with lead can also get lead on their hair, body, clothing, and shoes and then bring the harmful lead dust home to their families.

To help prevent exposure to lead dust:

Check window wells and sills for chipping and peeling paint. Deteriorating paint in window sills and window wells is the most common source of lead exposure in the home.

Be careful about tracking lead dust into the home. Family members or pets can bring in lead-contaminated soil, dust, and paint into the home - where it can end up on floors, or embedded in carpeting.

Be careful if you work with lead - at home, on the job, or while participating in a hobby. An adult who works with lead can bring lead dust into the home on their hair, body, clothing, and shoes - and expose the whole family to harmful lead dust.

Learn how to safely work with lead as you repair or remodel an older home. If you disturb any surfaces covered with lead-based paint, you will release small particles of lead dust.

[back to top]

Lead in Soil

To find out if you may have a problem with lead-contaminated soil, ask the following questions:

Is your property located near a busy street? Bare soil next to a busy street or roadway can be contaminated with lead. During the years when lead was used in gasoline, the exhaust from cars and trucks would release small particles of lead into the air, and this lead fell into the soil. The lead stays in the soil.

Do you have any bare soil areas - bare soil is any soil you can see - around the foundation of a building, near a fence, or under a deck? Are there paint chips in the soil? If so, your soil could be contaminated with lead paint chips or lead dust.

Are there bare soil areas around the foundation of a building, or elsewhere on the property where lead paint chips and dust may have fallen to the ground, while a building was being scraped and painted in the past? These paint chips and small pieces of lead dust could still be in the soil.

[back to top]

Lead in Drinking Water

It is not common to find high amounts of lead in drinking water. To find out if you may have a problem with lead in your drinking water, ask this question:

Do you have lead water pipes, copper pipes joined with lead-based solder or brass faucets? If the answer is yes, your drinking water could be contaminated with lead. The only way to know for sure if you have too much lead in your drinking water, is to have a sample analyzed by a certified laboratory. Contact the MDH for information about taking the water sample, and a list of certified laboratories.

[back to top]

If you have any of these conditions on your property, you may have a problem with lead. The only way to know for sure is to have a lead evaluation conducted by a professional licensed by MDH. The MDH offers free information about how to manage and clean up sources of lead, and how to reduce lead exposure.

Call MDH at 651-215-0909 to:

- order fact sheets describing how to safely remodel and repair older homes that may contain lead
- order a fact sheet describing how to clean up sources of lead
- order information about other potential sources of lead in the home such as pottery and china
- request a list of MDH licensed lead professionals trained to do lead assessments.

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To request this material in another format, contact:

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