EVALUATION OF MINNESOTA'S LEAD PROGRAM

August 1997

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EVALUATION OF MINNESOTA'S LEAD PROGRAM
REPORT TO THE LEGISLATURE

EXECUTIVE SUMMARY

This report is required by Minnesota Statutes, section 144.9509, subd. 3, which state:

> 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 for 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.

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

Compliance Status

During 1996, there were 403 cases of elevated blood lead that required lead inspections by state, city, or county officials. Since elevated blood lead cases occasionally involve two or more siblings residing within the same household, the number of initial lead inspections performed was 354. Orders to reduce the lead hazard were issued to the property owners after almost all initial inspections. In a few cases, a probable source of lead exposure was not found in the family's current home.

Federal lead regulations were adopted by the U.S. Environmental Protection Agency (EPA) on August 29, 1996, and states have until August 31, 1998, to adopt rules that are at least as stringent as these EPA regulations. Minnesota Statutes require the Minnesota Department of Health (MDH) to undertake the rule making and procedural steps needed to obtain approval from EPA. While MDH will need to revise its existing lead regulations to meet the EPA requirements, additional enforcement tools will not be needed to meet this requirement.

Incidence of Elevated Blood Lead Levels

The majority of elevated blood lead levels reported to MDH are for children living in the cities of Minneapolis and St. Paul. The smaller number of elevated blood lead cases reported in the rest of the state may reflect the lack of routine blood lead testing in areas outside of Minneapolis and St. Paul.

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LEAD PROGRAM STATUS

June 1997

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This report cost $1,500 in staff time and printing costs.

I. Background

Lead has been used in a wide variety of industrial and consumer products. Some of these uses left reservoirs of lead in the human environment. The sources that most commonly exposure 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 under 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 human environment and present a continuing hazard.

property owner insurance liability policies;
(4) identify the legal rights and responsibilities of landlords to provide lead-safe housing and the legal rights and responsibilities of both landlords and tenants to maintain lead-safe property; and
(5) study the legal liability of landlords and tenants when a child becomes lead poisoned, and propose methods to reduce property owner liability while still protecting the legal rights of children who become lead poisoned.

The task force was directed to report its findings and proposals to the 1998 legislature. The members of the advisory task force on lead hazard reduction include:

(1) the chairs, or the chairs' designees, of the House Housing and Housing Finance Division, and the Family and Early Childhood Education Finance Division;
(2) the chairs, or the chairs' designees, of the Senate Jobs, Energy, and Community Development Committee, and the Family and Early Childhood Education Finance Division;
(3) one house member from the minority caucus, appointed by the speaker, and one senator from the minority caucus, appointed by the Committee on Rules and Administration;
(4) the commissioner of Commerce or the commissioner's designee;
(5) the commissioner of the Housing Finance Agency or the commissioner's designee;
(6) the commissioner of health or the commissioner's 2.18 designee; and
(7) up to 15 members appointed jointly by the commissioner of commerce and the commissioner of the Housing Finance Agency to represent the following interests: landlords, tenants, attorneys practicing landlord tenant law, parents of children with lead poisoning, swab teams, insurers, the education association, family physicians and pediatricians, Realtors, the Children's Defense Fund, the federal Environmental Protection Agency, building inspectors, the paint and coatings industry, and local boards of health.

The ranking of census tracts was done on a pilot basis and found to be problematic. Before a computer program can rank all of the tracts by the statutory criteria, tens of thousands of individual addresses must each be assigned a census tract number. Since this is very labor intensive and currently has no useful application, MDH has made this project a low priority.

Originally, the blood lead data collection effort was limited to counting the number of cases of lead poisoning. However, much more blood lead and demographic data are needed for statistical analyses to calculate the incidence or prevalence of a disease, to identify groups within the general population who have disproportionately high blood lead levels, to identify culpable sources of lead exposure, and to measure the effectiveness of interventions.

The quality of data obtained by survey and surveillance activities is rapidly being upgraded by the work of additional MDH staff. Quality assurance for blood lead and environmental lead data is very labor-intensive. Staff funded by federal grants have recently been added to perform this work. Validation studies were implemented in 1996 to determine the completeness, accuracy,

further, because the department has initiated rule making to ensure that Minnesota's rules are at least as stringent as the EPA regulations adopted in August 1996.

The department does not have independent information on the performance of inspections by boards of health that retained their authority to conduct lead inspections. No complaints have been received by the department about board of health inspections or orders.

A. Description of Survey and Surveillance Activities

Minnesota Statutes, section 144.9502, requires the commissioner of health to establish a statewide lead surveillance system. The purpose of this system is to: 1) monitor blood lead levels in children and adults, to identify trends and populations at high risk for elevated blood lead; 2) ensure that screening services are provided to populations at high risk for elevated blood lead; 3) ensure that medical and environmental follow-up services are provided for children with elevated blood lead; and 4) provide accurate and complete data for planning and implementing primary prevention programs that focus on populations at high risk for elevated blood lead.

An epidemiologist and health program representative were hired in 1995 and 1996, respectively, to improve and enhance the completeness, accuracy and timeliness of the blood lead database. The current blood lead surveillance system was evaluated to define problems and suggest corrective actions. The evaluation of the surveillance system used criteria developed by the CDC's Epidemiology Program Office, titled "Guidelines for Evaluating Surveillance Systems." These criteria include:

a. Simplicity (Is the structure of the database simple and easy to operate while meeting the objectives?)
b. Flexibility (Can the database adapt to changing information, needs, or operating conditions with little additional cost in terms of personnel or allocation of funds?)
c. Acceptability (How willing are individuals and organizations to participate in the database?)
d. Sensitivity (What proportion of the cases are detected by the database?)
e. Positive Predictive Value (What proportion of cases identified as cases truly belong in the database?)
f. Representativeness (Does the database accurately describe the occurrence and distribution of elevated blood lead in the population?)
g. Timeliness (Does the database receive case reports in an appropriate time frame useful for follow-up and identification of trends?)

The blood lead surveillance system was evaluated and several concerns were identified. Corrective actions were taken. Some of the major activities undertaken are described below.

During 1995, MDH staff visited ten of the thirteen Minnesota laboratories which perform lead analyses. The purpose of these visits was to discuss the concerns that laboratories had in reporting analytical results to MDH. As a result of these discussions, reporting instructions were prepared for clinics and laboratories, and reporting methods were adapted to encourage better reporting, with an emphasis on electronic reporting. (See Appendix B for two fact sheets, "Reporting Requirements for Facilities Performing Blood Lead Analyses" and "The Primary Care Provider's Role in Blood Lead Surveillance Reporting.") A new database was designed and implemented to facilitate electronic reporting by laboratories.

and new materials are generated as needs indicate and resources permit

MDH has four health educators who work on lead-related public health education and outreach to the public. Three of the four are supported by federal grants. Other lead program staff also contribute to outreach activities, either by giving presentations as requested or by handing out written materials and talking to families during lead inspections. Materials are also distributed to the public by local health departments and health care providers.

Effective health education requires that the information be presented in ways that are appropriate to the intended audience. The audiences can vary from physicians to recent immigrants who may not speak English. In order to reach two major non-English speaking population groups in Minnesota, written materials have been developed in Spanish and two Hmong-language videotapes have been produced. Minnesota has one of the largest Hmong populations in the nation, and Minnesota's Hispanic population is increasing.

In addition to mandating that MDH provide lead-related health education and outreach, the state lead statute requires production of "lead directives," which are non-regulatory safety guidelines for remodeling activities. These guidelines describe lead-safe work practices for homeowners and general contractors who may come in contact with sources of lead on the job. They were prepared with the input of a statutorily-mandated advisory group that included representation of builders, weatherization providers, nonprofit rehabilitation organizations, each of the affected trades, housing and redevelopment authorities, local health officials, and affected state agencies. The directives make up a series titled Safely Working with Lead While Remodeling the Older Home. The series includes eight fact sheets: *Testing the Home for Lead*; *Removing and Covering Interior Paint*; *Replacing Doors, Windows and Trim*; *Taking Down a Wall*; *Removing Carpet*; *Removing Paint from Exterior Surfaces*; *Working with Soil*; and *Disposal of Lead-Contaminated Waste*.

MDH collaborated with St. Paul Public Health to fund production of a videotape version of the lead directives. The videotape was provided jointly by MDH, the city of St. Paul, and the Upper Swede Hollow Neighborhood Association, which is a nonprofit, community-based organization in St. Paul. The video was completed in early 1997.

A new health education tool is being developed primarily for use by public health nurses who are educating the families of children with elevated blood lead levels. This tool is known as a "flip chart." This device displays illustrations for the family on one side while providing appropriate text on the flip side to cue the nurse's comments. The family simultaneously receives visual and verbal messages that describe methods for managing lead hazards in the home, and reducing a child's blood lead level. The illustrations are scanned into a computer file which means that they can be changed to address the needs of different racial or ethnic groups, or to present different residential building types. While the flip chart is still currently in development, the concept and draft versions have received very favorable reactions from other states and from EPA, which is helping to fund it. The department will be scheduling meetings with public health nurses around the state to demonstrate use of the finished flip chart.

MDH approves lead training courses for inspectors, contractors, and workers. The lead statute

Minneapolis and St. Paul. Table 1 on the next page summarizes the inspections conducted in 1996.

IV. Additional Enforcement Procedures, Recommendations, and Costs

The Health Enforcement Consolidation Act provides adequate authority for lead enforcement by MDH. No additional enforcement authority is needed. However, some problems are not amenable to an enforcement action.

Property owners who genuinely lack the resources to comply with their lead orders, but who do not qualify for housing assistance programs, may have to abandon their property if faced with financial penalties for failure to comply. Even if a property owner qualifies for public assistance, the waiting list may exceed the statutory 60-day limit on completing ordered lead work.

Property owners generally comply with lead orders. MDH has used the Administrative Penalty Order provisions of the Health Enforcement Consolidation Act in only two cases involving contractors.

Clinics are not required to report demographic information to their reference laboratories. The laboratories can report the blood lead levels but are unable to include demographic data unless the clinics provide this information. This is a logistical problem that the Blood Lead Advisory Group should have the opportunity to address before the department proposes any additional reporting requirements.

Enforcement actions are not an appropriate tool for obtaining blood lead level reporting from laboratories outside of Minnesota. Small hospitals and clinics often send blood samples to reference labs, some of which are not in Minnesota. Large hospitals often have in-house labs.

V. Blood Lead and Environmental Lead Analyses

Blood lead summary data are reported by MDH to local boards of health on an annual basis as part of the Community Environmental Health Profiles (see Appendix E). These profiles provide data for each community on a variety of environmental health issues. The profiles allow local officials to evaluate possible health hazards within their communities, and to help plan and set priorities for the use of resources for addressing those hazards. Local public health nursing staff also receive data on specific cases of elevated blood lead as they arise. The nursing staff usually provide health education to the affected families.

The development of an environmental database is required under Minnesota Statutes 144.9502, subd. 6. The development and use of the database have not been initiated due to resource limitations. However, a blood lead tracking software program called STELLAR (Systematic Tracking of Elevated Lead Levels and Referral) is currently being evaluated. This program has the capacity to collect environmental data as well as demographic data. STELLAR was developed for the CDC, which is promoting its use nationally.

VI. Resource limitations

Resource limitations affect the ability of people to comply with Minnesota's lead standards and rules, and the ability of the agencies to enforce those standards and rules.

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 specially intended to accomplish lead abatement or lead hazard reduction. The rules apply to such work whether the work is done under lead orders or is done voluntarily. The rules do not apply, however, to remodeling, repainting, renovating, or any other work undertaken for reasons other than lead abatement or lead hazard reduction, even if lead-based paint is disturbed in the process of completing the work. MDH has prepared statutorily required, non-regulatory guidelines called "lead directives," which are intended to provide safety advice for people engaged in these activities.

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 abatement and lead hazard reduction are seldom done, because they are not perceived as increasing the value of the property, or increasing the rent that can be charged.

Four city governments and eleven county governments have retained authority and responsibility for lead inspections. All have received subsidies for training lead inspectors. The cities of Minneapolis and St. Paul have received grants for temporary lead-safe housing for families displaced by lead orders from the cities.

Funding sources are a major future concern for lead surveillance and prevention programs. Currently, almost all lead program positions are federally-funded and any reduction in funding

APPENDICES

A. Lead Information Request Form

B. Reporting Requirements for Facilities Performing Blood Lead Analyses
(From: *Disease Control Newsletter;* vol. 24, issue 6, page 63, August-September 1996, Minnesota Department of Health)

The Primary Care Provider's Role in Blood Lead Surveillance Reporting

C. Statement of Intent for the Blood Lead Advisory Group

D. Maps

E. Minnesota Blood Lead Surveillance Data, 1995

Appendix A

Lead Information Request Form

LEAD INFORMATION REQUEST FORM 8/97

Name: _____

Organization: _____

Address: _____

City/State/Zip: _____

Phone: _____

Indicate quantity of materials on appropriate line.

_____ About Lead and Pregnancy
_____ An Unwanted Souvenir: Lead in Ceramic Ware
_____ Coloring Book "My Book About Staying Safe Around Lead"
_____ Coloring Sheet "Protect Yourself From Lead"
_____ Hmong booklet "What is lead?"
_____ Lead and Your Children *Spanish version*
_____ Lead in the Home and Urban Soil Environment
_____ Lead Poisoning and Children
_____ Let it run . . . and get the lead out!
_____ Order Form "Educational Materials, Fact Sheets & Videos"
_____ Order Form "Remodeling Fact Sheets"
_____ Preventing Lead Poisoning in Young Children (CDC)
_____ Pretty Poison: Lead and Ceramic Ware
_____ Protecting Your Family From Lead in Your Home pamphlet (EPA)
_____ Protecting Yourself From Lead (Work Safety Fact Sheet)
_____ Residential Lead Paint Waste Disposal
_____ Rules *or* _____ Draft Rules
_____ Statute
_____ Strategic Plan to End Childhood Lead Poisoning
_____ Take-home Lead: A Preventable Risk for Your Family
_____ The Lead Link
_____ What You Should Know About Lead in China Dishes

_____ **HOME PACKET** (includes the following in English):
Clean Up of Lead Dust
Common Sources of Lead _____ *Spanish version*
Facts About Lead Poisoning _____ *Spanish version*
What is Lead Poisoning? _____ *Spanish version*
Lead Abatement: Facts You Should Know
Lab List

_____ **REMODELING PACKET** (includes the following):
Disposal of Lead-Contaminated Waste
Removing and Covering Interior Paint
Removing Carpet
Removing Paint from Exterior Surfaces
Replacing Doors, Windows and Trim
Taking Down a Wall
Testing the Home for Lead
Working with Soil

_____ **DISCLOSURE PACKET** (includes Protect Your Family From Lead in Your Home pamphlet)

_____ **Other:** _____

Submitted By: _____ Date Submitted: _____ Date Sent: _____

Appendix B

Reporting Requirements for Facilities Performing Blood Lead Analyses

(From: *Disease Control Newsletter;* vol. 24, issue 6, page 63, August-September 1996, Minnesota Department of Health)

The Primary Care Provider's Role in Blood Lead Surveillance Reporting

Reporting Requirements for Facilities Performing Blood Lead Analyses

The Acute Disease Epidemiology Section revised the Communicable Disease Reporting Rules in 1995. Before that revision, blood lead analysis results were included in those rules. Currently, blood lead analysis results are no longer required to be reported with the Communicable Disease Reporting Rules. However, all blood lead analyses are still reportable to MDH according to the revised (1995) statute on blood lead surveillance. (MN Statutes, Section 144.9502).

BLOOD LEAD SURVEILLANCE

The purpose of the blood lead surveillance system is to:

- monitor blood lead levels in children and adults;
- identify and monitor geographic and demographic trends;
- provide information needed for medical and environmental follow-up of children with elevated blood lead levels; and
- provide data for planning and implementing prevention strategies for populations at high risk for elevated blood lead levels.

WHEN TO SUBMIT REPORTS

The 1995 statute requires that facilities performing blood lead analyses report the results of all elevated venous blood lead analyses—15 micrograms per deciliter (*u*g/dl) or higher—within two working days to the Minnesota Department of Health (MDH). Facilities must also provide written or electronic confirmation of these and *all* other blood lead tests within one month. Elevated blood lead tests need to be reported immediately to facilitate medical intervention, environmental mitigation, and prevention activities.

HOW TO SEND REPORTS

Report within two working days the results of venous blood lead tests of 15 *u*g/dl or higher, by telephone, by fax, or electronically (see below) to :

Telephone: (612) 215-0890

Fax: (612) 215-0980

Report within one month the results of all venous or capillary blood lead tests (including written confirmation for those with 15 *u*g/dl or higher) in writing, or fax, or electronically, to:

Indoor Air and Lead Unit
Minnesota Department of Health
P.O. Box 64975
St. Paul, MN 55164-0975

Laboratories may submit blood lead data on the MDH Blood Lead Report form, and may furnish this form to clients to submit with blood samples.

Further Information

To receive report forms, or for further information on blood lead surveillance or electronic reporting, contact:

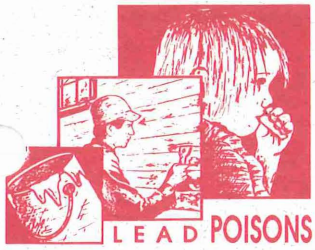
Myron Falken, Ph.D., M.P.H.
Senior Epidemiologist
Minnesota Department of Health
Environmental Health Hazards
Management Section (612) 215-0877

E-mail: myron.falken@health.state.mn.us

BLOOD LEAD DATA THAT MUST BE REPORTED TO MDH*

- Patient's name, address, city, state, zipcode, telephone number, birthdate, gender, and race
- Requesting physician/facility name, address, telephone number
- Date the sample was collected
- Date the sample was analyzed
- Blood lead result in *u*g/dl
- Type of blood sample—venous or capillary
- Method of analysis
- Laboratory/facility name, address, telephone number

*MN Statutes, section 144.9502, Childhood Lead Poisoning Prevention Act



The Primary Care Provider's Role in Blood Lead Surveillance Reporting

Minnesota facilities performing blood lead analyses are required to report the results of **all** *blood lead analyses to the Minnesota Department of Health. This fact sheet tells about lead surveillance and the data that reporting facilities need from health care providers.*

February 1996

The Need for Lead Surveillance

Lead in the environment poses a major threat to the health of America's children. In 1994, over 3,300 Minnesota children were found to have a venous blood lead level of 10 micrograms per deciliter (*u*g/dl) or higher. The U.S. Centers for Disease Control and Prevention considers 10 *u*g/dl or higher as the level associated with probable adverse health effects in children. The 1995 Minnesota Legislature made changes in the state lead surveillance system (Minnesota Statutes, section 144.9502) to better assess the scope of the problem.

The blood lead surveillance program collects and analyzes demographic, medical, geographic, and environmental data to better understand the occurrence of elevated blood lead cases in Minnesota. Surveillance information lays a critical foundation for developing strategies to protect people who are at greatest risk from the harmful effects of lead.

Reporting Requirements

The law requires that facilities performing blood lead analyses report the results of *all* blood lead analyses (venous and capillary) to the Minnesota Department of Health. In order for the laboratories and other facilities to meet this requirement, *they need patient information that is available only from the health care provider or facility requesting the analysis.*

Data to Submit

with All Blood Lead Samples Sent for Analysis

- ❒ **Patient's:**
  - **Name**
  - **Address**
  - **City, State, Zip**
  - **Phone number**
  - **Birthdate**
  - **Gender**
  - **Race**
- ❒ **Physician or facility name, phone number, full address**
- ❒ **Date the sample was collected**
- ❒ **Type of blood sample— venous or capillary**

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Appendix C

MDH Blood Lead Surveillance Advisory Group

Statement of Intent

MDH Blood Lead Surveillance Advisory Group

Statement of Intent

The Minnesota Department of Health (MDH) is establishing an advisory group to review the blood lead surveillance system and suggest ways to improve it. The advisory group is comprised of persons with medical, epidemiological, and laboratory expertise. This statement describes the need, purpose, and objectives of the advisory group.

The Need. Epidemiological surveillance contributes to the prevention and control of adverse health events, and includes an improved understanding of the public health implications of such events.

The MDH Environmental Health Division is evaluating and improving the effectiveness of blood lead surveillance. Collaboration between primary health care providers, laboratories, public health agencies, and the state health department is essential for surveillance to be effective. Working together with the MDH technical staff, the constituents of the surveillance system can identify risk factors, assess control measures, and improve clinical practices towards preventing lead poisoning. The advisory group provides a mechanism through which collaboration can occur in developing recommendations for improvements. The advisory group will extend and supplement the expertise of the department's technical staff.

The Purpose. The Blood Lead Surveillance Advisory Group will review the present blood lead surveillance system and provide recommendations on ways to improve it.

The Objectives. The Blood Lead Surveillance Advisory Group will:

- ♦ review the current procedures of the blood lead surveillance system;
- ♦ identify barriers to lead testing;
- ♦ identify social, cultural, and economic issues associated with lead testing;
- ♦ identify communication and information needs of health care providers;
- ♦ assist in the development of standard guidelines for blood lead testing;
- ♦ advise the division on strategies to improve the blood lead surveillance system; and
- ♦ by December 1996, prepare a report with recommendations for strategies to improve the MDH's blood lead surveillance system.

Appendix D

Census Tract Maps of Blood Lead Levels

Minneapolis Children In Lead Study Ages 0 - 6 Years (1995), as a Percent of All Minneapolis Children Ages 0 - 6 Years (1990)

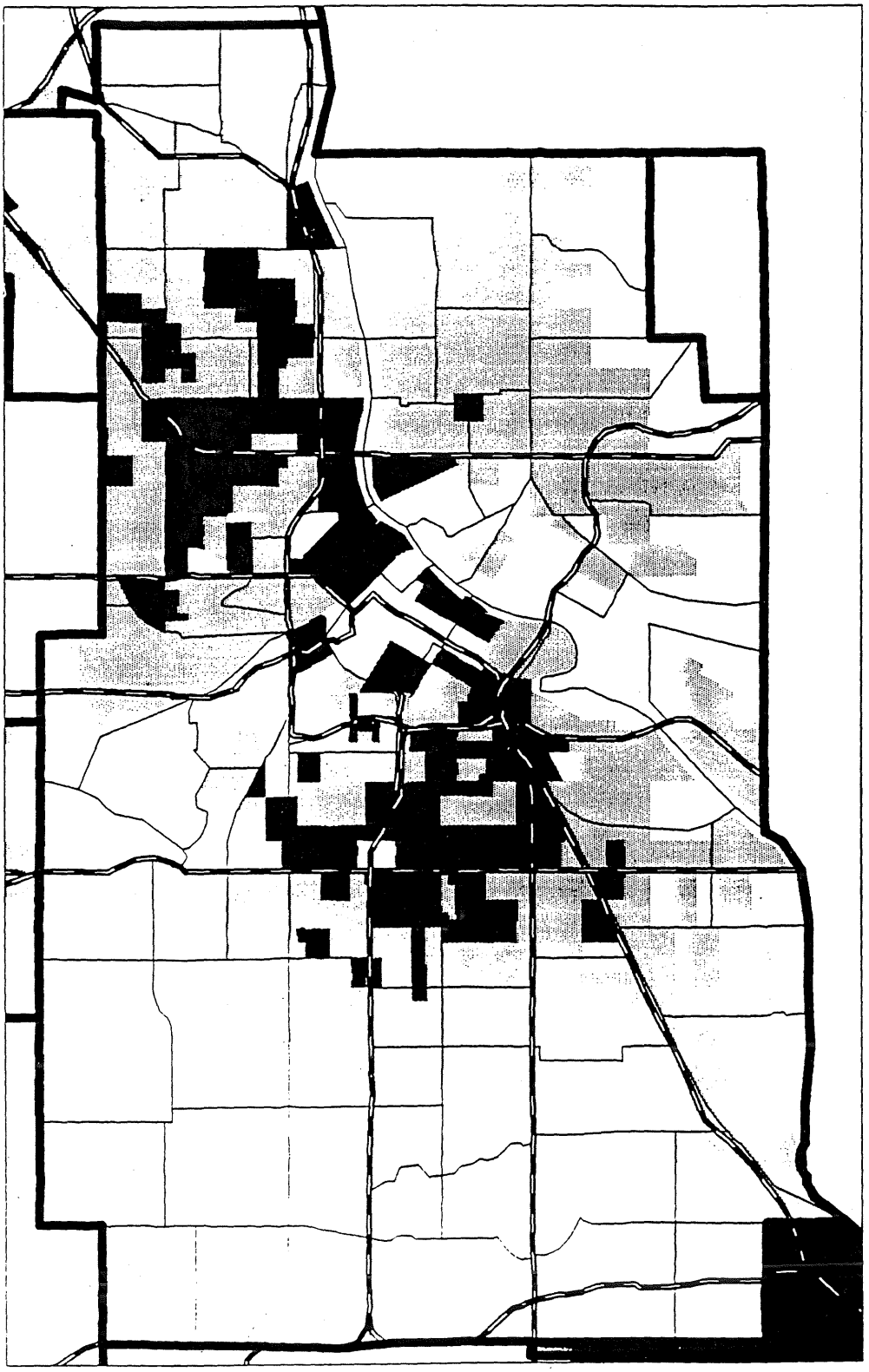
Minneapolis Location of Test Subjects with Blood Lead Levels 20.0, or Greater

Minneapolis Location of Test Subjects with Blood Lead Levels Between 15.0 and 19.9

Minneapolis Location of Test Subjects with Blood Lead Levels Between 10.0 and 14.9

Minneapolis Children in Lead Study Ages 0-6 Years (1995), as a Percent of All Minneapolis Children Ages 0-6 Years (1990)

Data Aggregated by 1990 Census Block Group



Note: Multiple testings of each child are not included in this calculation. Each child tested is represented only once.

Lead Study Children
As % of All Children

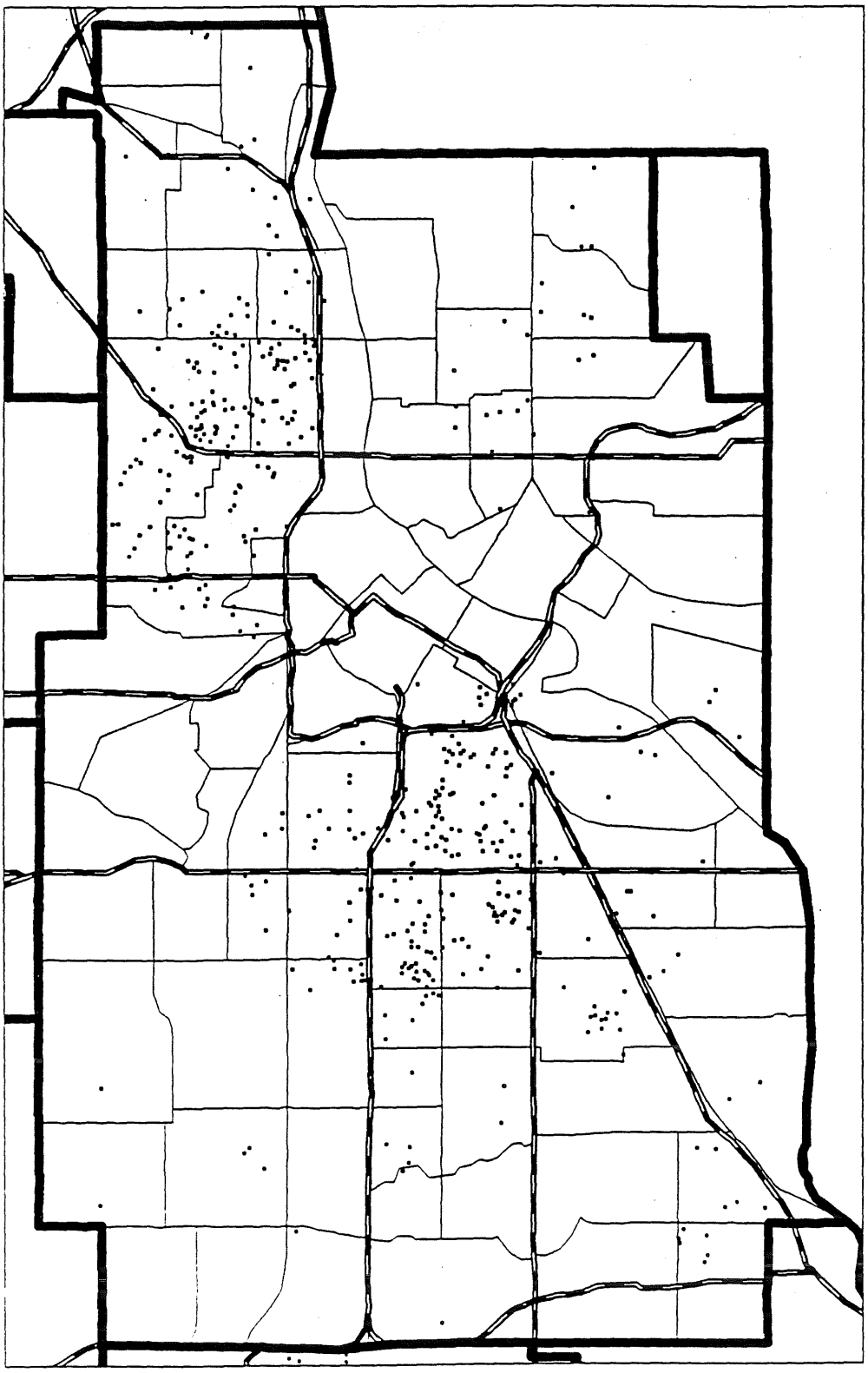
- 50% and Over
- 25% to 49%
- 10% to 24%
- 0% to 9%

- Major Roads
- Neighborhoods
- Cities

Source: Hennepin County Community Health Department, 1995; 1990 U.S. Census
Produced by: Hennepin County Office of Planning and Development, January 3, 1996

Minneapolis Location of Test Subjects With Blood Lead Levels 20.0, or Greater

Data Aggregated by 1990 Census Block Group



One dot equals one person, randomly distributed within a census block group.

Major Roads

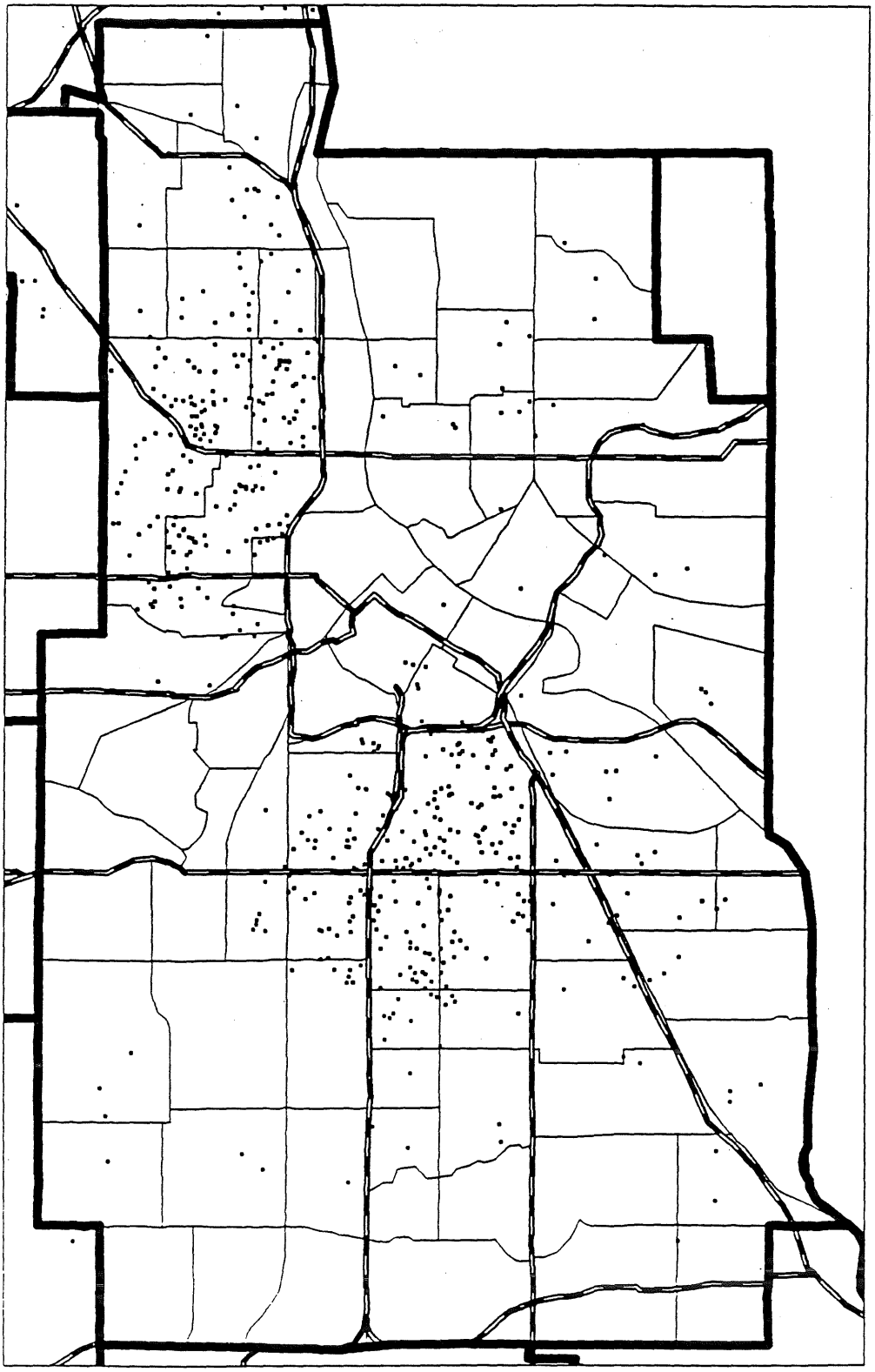
Neighborhoods

Cities

Source: Hennepin County Community Health Department, 1995
Produced by: Hennepin County Office of Planning and Development, January 3, 1996

Minneapolis Location of Test Subjects With Blood Lead Levels Between 15.0 and 19.9

Data Aggregated by 1990 Census Block Group



One dot equals one person, randomly distributed within a census block group.

Major Roads

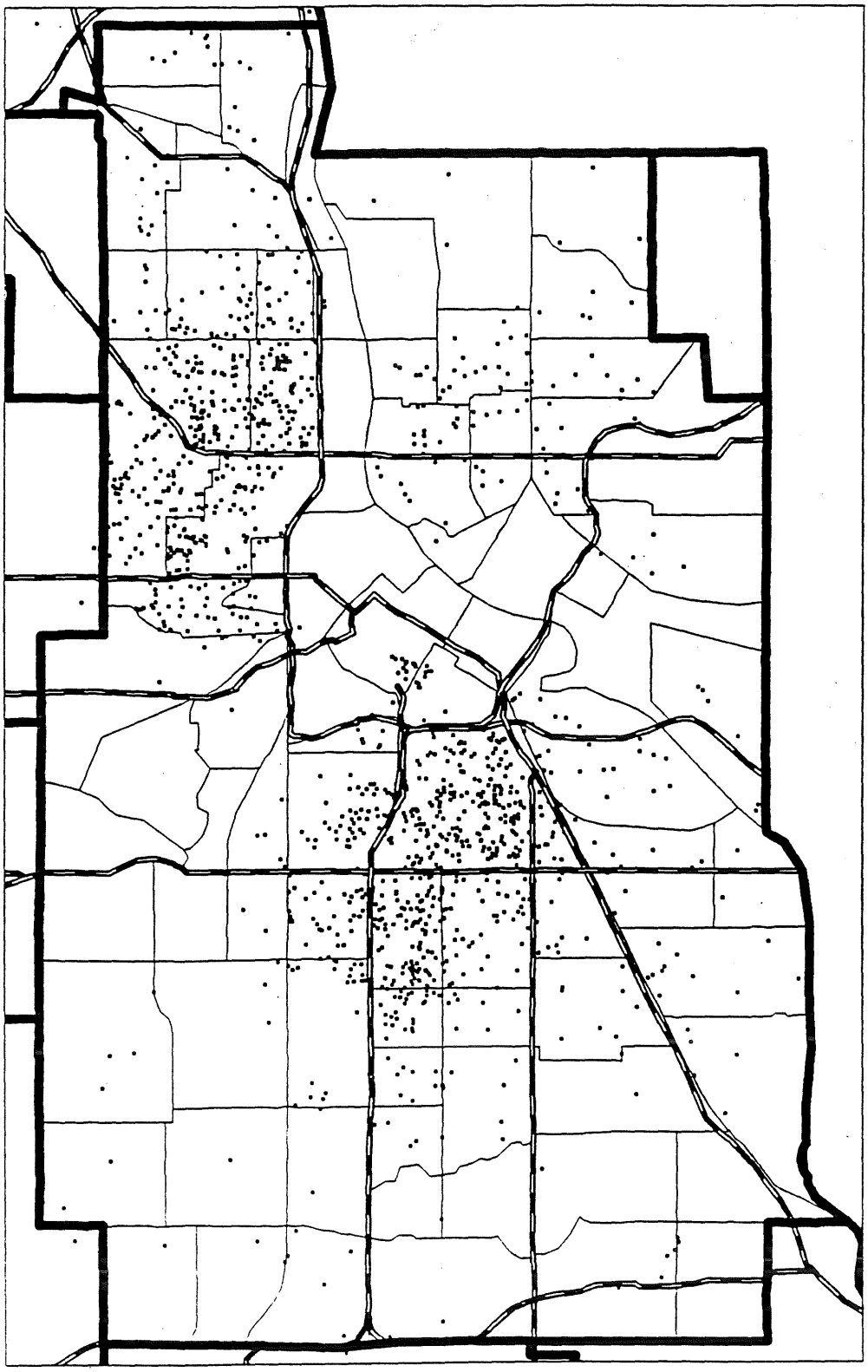
Neighborhoods

Cities

Source: Hennepin County Community Health Department, 1995
Produced by: Hennepin County Office of Planning and Development, January 3, 1996

Minneapolis Location of Test Subjects With Blood Lead Levels Between 10.0 and 14.9

Data Aggregated by 1990 Census Block Group



One dot equals one person, randomly distributed within a census block group.

Major Roads

Neighborhoods

Cities

Source: Hennepin County Community Health Department, 1995
Produced by: Hennepin County Office of Planning and Development, January 3, 1996

Appendix E

Minnesota Blood Lead Surveillance Data, 1995

Minnesota Blood Lead Surveillance Data, 1995

Lead: A hazard to health

Exposure to residential sources of lead is the most common environmental health hazard to children under six years of age. The Third National Health and Nutrition Examination Survey estimates 8.9 percent of the population aged 1 to 5 years have blood lead levels of 10 micrograms of lead per deciliter of blood (μg/dL) or greater and 1.1 percent have blood lead levels of 20 μg/dL or greater. 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 dirt around a home, and makes chips of paint accessible to children.

Legal requirements for management

Venous and capillary blood samples collected under the direction of a physician are sent to medical laboratories for analyses. Medical laboratories in Minnesota are required to report all blood lead analyses to the Minnesota Department of Health (MDH). Lead program staff advise local health departments of elevated venous blood lead levels in children under six years of age that require follow up. Families of children with blood lead levels of 10 μg/dL or greater are required by state law to receive lead education from public health agencies. Homes of children with venous blood lead levels of 20 μg/dL or greater, or with levels of 15-19 μg/dL that persist for 90 days, must be inspected for lead hazards so that homes can be made lead safe. Pregnant women with blood lead levels of 10 μg/dL or greater also receive intervention. Venous blood lead levels of 40 μg/dL or greater in adults are reported to the Occupational Safety and Health Administration of the Minnesota Department of Labor and Industry for follow up.

Data reported to the state

A total of 48,898 blood lead tests for 43,486 children and adults submitted by medical laboratories in 1995 are included in the MDH database. The totals include all patients tested with an elevated blood lead level in 1995 regardless of whether they had an elevated blood lead level in previous years. These tests include patients of all ages and include multiple tests on patients. Tests are reported for capillary, venous, and unknown types of blood draws. Quality control procedures instituted in 1995 have reduced errors in the accuracy and completeness of the current data. The MDH may still be missing data from laboratories located outside of Minnesota.

The following table shows the numbers of children 0 to 72 months of age tested in 1995 according to blood lead level. Data for the cases of 15 μg/dL and greater are venous results only. Data for all other cases are for children or adults with venous, capillary, or unkown type of test results. The data on elevated blood lead levels have undergone quality control checks to assure the accuracy

of the reports and completeness of the data. Data on blood lead levels less than 10 μg/dL were not included because they may not be complete or accurate. Data include reports received between January 1 and December 31, 1995.

Lead poisoning prevention

By law, the type of intervention required for families is dependent on the blood lead level of the child. Local public health agencies may be involved in providing education to families or 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.

Testing for blood lead is ordered at the discretion of individual physicians. No commonly accepted criteria are used in Minnesota to determine who should be screened. While the CDC recommends screening all young children for elevated blood lead, this may not be necessary or feasible in some areas of the state.

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 physicians in the area; the age and condition of housing stock; occupational and community sources of lead; and risk factors in the population (see below). 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. Although these comparisons are useful in evaluating local conditions, these are not true rates and must be used cautiously. True rates can be calculated when there is universal screening or when the population screened is representative of the entire population.

Risk factors for lead exposure include the following:

- 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
- Less parental supervision - children eat more non-food items
- Less parental education - lack of awareness of lead hazards
- Urban residence - more lead sources such as contaminated soils
- Recent or ongoing home remodeling - increases dust and paint flakes in home

For more information on surveillance for elevated blood lead levels, contact the Health Risk Assessment Unit, Section of Environmental Health Hazard Management: Myron Falken, 612/215-0877.

Data from the *Minnesota Environmental Health Profile, 1995 Data,* published by the Minnesota Department of Health, Division of Environmental Health, in November, 1996.

Numbers of Patients Tested in 1995 According to Age and Blood Lead Level, In Micrograms per Deciliter (μg/dL)

County	Children[1]				Adults[2]
	10 to 14.9[3] ug/dL	15 to 19.9[4] ug/dL	20 ug/dL[4] or greater	Total Tested (number)	40 ug/dL or greater
Aitkin	0	0	1	22	0
Anoka	42	3	2	1008	2
Becker	14	2	1	290	0
Beltrami	17	0	0	239	0
Benton	1	0	0	68	1
Big Stone	3	0	0	13	0
Blue Earth	27	5	0	287	1
Brown	4	1	2	108	0
Carlton	4	1	2	103	2
Carver	1	1	0	145	0
Cass	3	0	0	85	0
Chippewa	6	0	0	41	0
Chisago	6	2	1	64	0
Clay	4	0	1	123	0
Clearwater	8	0	0	54	0
Cook	0	0	0	42	0
Cottonwood	4	1	1	41	0
Crow Wing	8	2	2	141	0
Dakota	21	4	4	874	11
Dodge	3	0	1	41	0
Douglas	17	2	1	97	0
Faribault	5	0	0	74	0
Fillmore	17	2	1	104	0
Freeborn	18	2	0	263	2
Goodhue	16	3	0	163	0
Grant	13	1	1	34	0
Hennepin	1624	400	270	14174	8
Houston	6	0	2	94	0
Hubbard	1	0	1	17	1
Isanti	3	0	0	130	0
Itasca	14	1	1	164	0
Jackson	5	1	0	62	0
Kanabec	5	0	0	39	0
Kandiyohi	1	0	0	16	0
Kittson	6	1	0	32	0
Koochiching	5	0	0	31	0
Lac Qui Parle	4	0	0	18	0
Lake	0	0	0	14	0
Lake of the Woods	0	0	0	1	0
Le Sueur	9	1	2	75	0
Lincoln	5	0	0	21	0
Lyon	11	0	0	70	0
Mahnomen	3	0	1	87	0

Data from the *Minnesota Environmental Health Profile, 1995 Data,* published by the Minnesota Department of Health, Division of Environmental Health, in November, 1996.

County	Children[1]				Adults[2]
	10 to 14.9[3] ug/dL	15 to 19.9[4] ug/dL	20 ug/dL [4] or greater	Total Tested (number)	40 ug/dL or greater
Marshall	3	0	0	20	0
Martin	9	1	0	102	0
McLeod	2	0	0	45	1
Meeker	0	1	0	7	0
Mille Lacs	8	1	0	64	0
Morrison	3	0	0	156	0
Mower	6	3	2	99	1
Murray	3	1	1	35	0
Nicollet	15	1	0	123	0
Nobles	22	4	2	266	0
Norman	5	0	0	23	0
Olmsted	11	10	3	213	0
Otter Tail	16	0	0	167	0
Pennington	3	0	0	17	0
Pine	6	0	0	64	0
Pipestone	7	3	0	32	0
Polk	25	1	3	168	0
Pope	7	1	0	59	0
Ramsey	693	155	105	7309	15
Red Lake	0	0	0	8	0
Redwood	7	1	0	68	0
Renville	9	0	1	105	0
Rice	14	1	0	139	2
Rock	0	1	1	11	0
Roseau	0	0	0	4	0
St. Louis	96	9	9	1324	5
Scott	4	0	0	94	0
Sherburne	1	0	0	166	0
Sibley	8	0	0	48	0
Stearns	11	3	1	185	0
Steele	10	1	0	237	0
Stevens	3	0	0	35	0
Swift	1	0	3	21	0
Todd	18	0	0	112	0
Traverse	5	0	0	32	0
Wabasha	5	0	0	35	0
Wadena	27	3	1	221	0
Waseca	8	1	0	79	0
Washington	18	3	1	413	1
Watonwan	9	2	1	78	0
Wilkin	2	0	1	33	0
Winona	30	7	1	198	9
Wright	4	0	0	176	0
Yellow Medicine	0	1	0	15	0
Minnesota	3098	651	434	32375	62

[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