ENDING CHILD LEAD EXPOSURE IN KENT COUNTY

Kent County Lead Task Force

January 2018

TABLE OF CONTENTS

Executive Summary

For thousands of years, humans have found innovative and profitable ways to use lead. Yet its dangers have been suspected or known since ancient times. Lead is especially harmful to children, though it has taken time for researchers to realize that even low blood lead levels are unsafe. Lead can damage rapidly-growing brains and stunt physical growth and development in young children.

Lead poisoning affects everyone

Lead poisoning contributes to health, school, and social problems. We all pay for these problems through public services for health care, special education, and behavioral interventions. Lead poisoning can affect future employment and reduce lifetime earnings.

From a big picture view, Kent County has made great progress in reducing childhood lead poisoning—by more than 90% since 2001. The bad news is that numbers and percentages of lead-poisoned children began rising again in 2014. In 2015, Kent County was the third worst in Michigan for its percentage of children with elevated blood lead levels (EBL). No Michigan zip code had more lead-poisoned children in 2015 or 2016 than the Grand Rapids 49507 zip code.

In September 2016, Kent County Board of Commissioners Chair Jim Saalfield created the Kent County Lead Task Force. He asked the lead task force to:

- Identify the contributing environmental factors of lead-based exposure and illness in Kent County.
- Investigate possible interventions (actions, policies, and programs designed to reduce lead-based exposure and illness).
- Make a formal report and recommendations to the community.

Lead-based paint and lead dust, not water, is the problem here

During nearly a year of monthly lead task force meetings, subject matter experts provided useful information for answering the questions of the Lead Task Force. They identified deteriorating lead-based paint and lead dust as the main contributing environmental factor in about 90% of all childhood lead poisoning cases in Kent County.

Doug Stek, City of Grand Rapids housing rehabilitation supervisor, said that four of five homes in Grand Rapids, and nearly three of five homes in Kent County, were built before 1978, the year lead was banned from paint. About 83,000 housing units—a third of all Kent County housing units—are considered at risk for lead paint hazards. These older homes have lead paint hazards inside, outside, and in bare soil around them.

As the local housing market tightens, more homes are being renovated, but remodelers don't always use lead-safe practices. Also, people are getting priced out of safer homes and into older, poorly-maintained dwellings. Both factors result in more exposure to lead dust in homes and bare soil.

Young children are most vulnerable to lead exposure. And the risk factors are cumulative and synergistic. Unfortunately, this means that lead poisoning is likely to have more impact

on young children who also deal with poverty, racism, and other stressors.

Limitations of current interventions

Lead exposure is any detectable blood lead level (BLL). Childhood lead exposure happens when children breathe, ingest, or absorb lead. No BLL has been identified as safe.

Children who test at ≥5 BLL are considered ***lead poisoned*** for the purposes of this report***.*** That means they have 5 or more micrograms of lead per deciliter of blood (ug/dL), so the U.S. Centers for Disease Control and Prevention (CDC) recommends medical intervention and prevention. That tiny amount of lead is roughly equivalent to 5 two-millionths of a penny in 3.4 fluid ounces, less than what's in a small juice box.

Subject matter experts described current interventions—and their limitations in reducing lead poisoning. The only way to confirm lead exposure and poisoning in children is to test their blood. The current model for getting the lead out is reactive treatment:

- Find out which children are already lead exposed or lead poisoned.
- Intervene by treating them to reduce EBL and mitigate damage.
- Intervene by finding ways to fix the environments (home, preschool, daycare) that caused the lead exposure. This includes performing and paying for lead abatement, interim control, or a combination.

The current model focuses on children most likely to be poisoned, but it doesn't find nearly enough of them. Even worse, it doesn't intervene till after children have been poisoned.

According to Michigan Department of Health and Human Services (MDHHS) annual data, less than a fifth of Kent County children under age 6 receive BLL tests. Most are enrolled in Michigan Medicaid or the Women, Infants, and Children program, which require BLL tests. But 80% of Kent County children under age 6 are not on Medicaid, and only about 6% of the children not on medicaid are tested.

Abatement means eliminating the lead hazard completely (or for at least 20 years). Examples include replacing windows and doors and installing vinyl flooring and siding. Totally abating lead hazards permanently can cost $40,000 per 1,200-square-foot unit.

Interim controls cost less but require more ongoing maintenance by owners and dwelling occupants. Examples include specialized cleaning methods, stabilizing paint, or preventing access to certain hazards. The average cost to remediate lead paint hazards in the city of Grand Rapids has been $10,473 per unit.

In 2015 (the last year for which MDHHS has released complete data), 610 Kent County children under 6 tested at ≥5 BLL. But if only 1% of Kent County's untested non-Medicaid children under 6 had EBL, then the county would know whether a projected 431 more children need treatment. Instead, lead slowly and silently accumulates in their bodies and keeps contaminating their environment.

Proactive primary prevention is better than reactive treatment

National, state, and local experts share the conclusion that lead poisoning is 100% preventable. Subject matter experts and

lead task force members agree that a better model would be to focus on proactive primary prevention. Eliminating child lead exposure requires "a new paradigm focused on primary prevention and health equity." That comes from a November 2016 report, A *Roadmap to Eliminating Child Lead Exposure.* Michigan Lieutenant Governor Brian Calley chaired the board that produced the report. It says that lead exposure disproportionately impacts low-income areas and minority children by affecting their cognition, behavior, and future earnings.

Adopting a proactive primary prevention model means testing housing and environments first—before children get exposed and poisoned. Most lead poisoning in Kent County results from lead paint hazards, so preventing lead exposure and poisoning requires removing those risks. A proactive primary prevention model will:

- Identify properties most at risk for lead paint hazards and prioritize areas of greatest need.
- Eliminate lead exposures by leveraging effective policies and investing in what promises the greatest return.
- Create universal BLL testing for children under age 6 to measure progress in eliminating lead exposure. Testing identifies poisoned children who need treatment and geographic areas that most need lead hazard control. Universal testing provides data on long-term effects of low lead exposure and best practices for treating lead poisoning.

Recommendations: It's time to shift paradigms

Although lead poisoning is 100% preventable, achieving blood lead levels (BLL) of zero in all Kent County children under age 6 may take a generation. The task is enormous, far too much for any one entity to solve on its own. Meanwhile, the Kent County Lead Task Force has a plan to begin the journey. It offers three overarching recommendations, followed by objectives for public education, policy, risk identification and elimination, and health care.

Therefore, the lead task force recommends that the Kent County Board of Commissioners immediately take three overarching actions:

- Charge the Kent County Community Health Advisory Committee (CHAC) to work with stakeholders to develop plans by September 30, 2018, for how the community can work toward fulfilling this report's recommendations.
- Charge CHAC to review EBL, monitor progress on this report's recommendations, and update the community at least once a year.
- Encourage State of Michigan officials to implement recommendations made by the Governor's Child Lead Poisoning Elimination Board in its November 2016 report, *A Roadmap to Eliminating Child Lead Exposure.*

The lead task force grouped its proposed objectives into four categories, described below with examples:

- **Public education:** Begin with a comprehensive public education campaign about lead exposure risks and mitigations. This should reach the whole community, including rental property owners and real estate agents, owners, renters, buyers, medical providers, building permit officials, hardware stores, churches, refugee

resettlement agencies, and other community-based organizations.

• **Policy:** Work with many government units, organizations, and programs to identify model ordinances and regulatory strategies that prevent and address lead hazards.The goal is to leverage and coordinate resources to test environments for lead, eliminate lead, test all children—and monitor progress—so we end childhood lead exposure.

• **Risk identification and elimination:** Explore every way to invest in lead risk assessment and abatement. Create a public access data system, so residents can share information on lead in soil, water, and homes. Partner with rental property owners, real estate agents, and contractors on ways to prevent and eliminate lead hazards—without displacing those who can least afford it. Offer training to many groups, from government employees and municipal water suppliers to childcare providers and residents, so more people know how to identify lead hazards.

• **Healthcare:** Encourage medical providers to test all children at 9 to 12 months and 24 to 36 months. Collect venous samples within a month of discovering EBL. Work with home health visitors, home healthcare providers, and health insurers to educate expecting and new parents about lead risk factors. Use community-based strategies to increase testing. Gather and share more and better demographic data. Find ways for insurance companies to incentivize providers for using lead screening questionnaires and testing children's blood for lead.

KENT COUNTY LEAD TASK FORCE: PURPOSE AND PEOPLE

For many years, Kent County children under 6 had declining blood lead levels (BLL). Everyone was surprised when the number of children with elevated BLL surged. It rose from 470 children under 6 (4.6% of tested children) in 2014 to 610 children (6.2%) in 2015.

The Kent County Board of Commissioners moved in September 2016 to form a lead task force composed of county commissioners, health and housing specialists, and community leaders. Its threefold purpose was:

- Identify the contributing environmental factors of lead-based exposure and illness in Kent County.
- Investigate possible interventions (actions, policies, and programs designed to reduce lead-based exposure and illness).
- Make a formal report and recommendations to the community.

Adam London, Kent County Health Department administrative health officer, met with a planning subcommittee in December 2016. They developed a timeline, monthly meeting schedule, and preliminary set of questions for subject matter experts to address. Kent County Lead Task Force members, staff, and subject matter experts are listed below.

KENT COUNTY LEAD TASK FORCE MEMBERS AND STAFF

Connie Bohatch, MPA, City of Grand Rapids community services managing director
Emily Brieve, Kent County commissioner and lead task force chair
Ken Fawcett, MD, Spectrum Health Healthier Communities vice president
Paul Haan, Healthy Homes Coalition of West Michigan executive director
Carol Hennessy, Kent County commissioner
Dan Koorndyk, Kent County commissioner
Senita Lenear, Grand Rapids city commissioner and lead task force co-chair
Adam London, MPA, RS, Kent County Health Department (KCHD) administrative health officer
Julie Rietberg, Grand Rapids Association of Realtors CEO
Rebecca Rynbrandt, MS, City of Wyoming director of community services
Amna Seibold, MHSA, City of East Grand Rapids mayor and Saint Mary's Health Care pathology director
Cameron VanWyngarden, MPA, Plainfield Charter Township superintendent
Matthew VanZetten, MPA, Kent County Interim Assistant County Administrator
Shannon Wilson, DPH, Grand Rapids African American Health Institute executive director

Cheryl Clements, KCHD senior administrative specialist (recorder)
Jim Dischinger-Smedes, MS, KCHD grants administrator
Joan Huyser-Honig, Huyser-Honig Creative Services consultant (report writer)
Shealyn McGee Sarns, 4ten Design & Photo (report graphic designer)

SUBJECT MATTER EXPERTS (in order of presentation)

William L. Bush, MD, Helen DeVos Children's Hospital pediatrician-in-chief
Bryan S. Judge, MD, FAAEM, FACMT, Spectrum Health medical toxicology and emergency medicine departments and Grand Rapids Medical Education Partners/Michigan State University College of Human Medicine emergency medicine residency program director
Gustavo Rotondaro, MS, Métrica principal
Zachary Weber, MS, Métrica data analyst
RoseAnn Miller, MS, PhD, Michigan Department of Health and Human Services (MDHHS) Childhood Lead Poisoning Prevention Program epidemiologist
Eric DeLong, City of Grand Rapids deputy manager
Joellen Thompson, City of Grand Rapids Water System manager
Eric Pessell, KCHD environmental health director
Kory Groetsch, MS, MDHHS environmental health division director
Catherine Phelps, AAA Lead Inspections president
Douglas Stek, City of Grand Rapids housing rehabilitation supervisor
Joann Hoganson, RN, MSN, KCHD community wellness division director
Chandy Colley, RN, MSN, KCHD program supervisor for refugee and lead programs
Brian Calley, MBA, MPA, State of Michigan lieutenant governor

GLOSSARY

10 Policies *10 Policies to Prevent and Respond to Childhood Lead Exposure,* August 2017 national report by Health Impact Project
≥5 µg/dL Current CDC reference level for elevated blood lead: greater than or equal to 5 micrograms of lead per deciliter of blood. A penny weighs 2 grams, so 5 micrograms of lead would be about as much as 5 of 2 million equal pieces of that penny. A deciliter of blood is about 3.4 fluid ounces, less than what's in a small juice box.
BLL Blood lead level(s)
CDBG U.S. Community Development Block Grants
CDC U.S. Centers for Disease Control and Prevention
CHAC Kent County Community Health Advisory Committee
CLPPP Childhood Lead Poisoning Prevention Program
CLEEC Child Lead Exposure Elimination Commission. Permanent team established by Governor Rick Snyder to carry out CLPEB recommendations.
CLPEB Child Lead Poisoning Elimination Board. Temporary team formed by Gov. Snyder to design a long-term strategy to eliminate lead poisoning in Michigan.
CHIP Children's Health Insurance Program
EBL Elevated blood lead or elevated blood lead level(s)
EPA U.S. Environmental Protection Agency
GIS Geographic information system
HUD U.S. Department of Housing and Urban Development
Lead exposure Any detectable amount of lead in blood
Lead hazard Presence of lead in air, water, soil, human-made products, etc.
Lead poisoning Blood lead levels ≥5 µg/dL
LHCP City of Grand Rapids Lead Hazard Control Program
LIRA Lead-based paint inspection and risk assessment. A paint inspection is a surface-by-surface investigation to find lead paint. A risk assessment investigates presence, type, severity, and location of lead hazards in paint, dust, and soil and suggests ways to control them.
LSL Lead service line delivering drinking water
MDHHS Michigan Department of Health and Human Services
Roadmap *A Roadmap to Ending Childhood Lead Poisoning,* November 2016 report by CLPEB for State of Michigan
RPOA Rental Property Owners Association
RRP EPA Lead Renovation, Repair and Painting Rule

Chapter 1: LEAD: SO USEFUL, SO DANGEROUS

For thousands of years, humans have found innovative and profitable ways to use lead. Yet its dangers have been suspected or known since ancient times. Lead is especially harmful to children, though it's taken time for researchers to realize that even low blood lead levels are unsafe. After years of decreasing blood lead levels among Kent County children, numbers rose in 2014, in 2015, and again in 2016. This chapter quantifies the situation in Kent County.

WHY PEOPLE USE LEAD AND HOW LEAD CAN HARM THEM

Humans have been using lead for thousands of years. This bluish-white heavy metal is found close to the earth's surface, so it's easy to mine. It is softer and quicker to melt in heat than most other heavy metals known since prehistoric times. When exposed to air, lead tarnishes to a dull gray that you may have admired on decorative leaded glass windows.

Lead is versatile

In ancient times, Egyptians would grind lead into black powder for use in cosmetic eye shadow. Throughout Asia and the Middle East, people variously made lead into coins, cookware glazes, building materials, slingshot ammo, and fishing sinkers. Healers in India and China included lead in plant based medicines.

Lead use peaked during the Roman Empire and Industrial Revolution. The Romans built their famous aqueducts with lead pipes because lead resists water and corrosion. They discovered that boiling sour wine in lead-glazed pots produced sweet-tasting lead acetate, also known as sugar of lead. Lead mining spiked again in mid-18th century England, as the rise in manufacturing created a need for lead in roofs, pipes, industrial castings, paints, and glazes.[1]

By the 1900s, England had depleted its lead supplies, and the U.S. became the world's top lead producer. Lead compounds and pigments in paint helped small amounts cover large areas, resist water, and retain colors. That's why lead paint was so popular for exterior, interior, and decorative use, including on cribs and toys. As more people bought cars, General Motors discovered that adding tetraethyl lead to gasoline prevented engine knock, improved efficient combustion, and let heavy vehicles reach higher speeds.

Lead-acid automotive batteries now account for about 85% of global lead use. The metal is also used in X-ray protective shields and in sheet roofing. In the U.S., nearly all the lead from old automotive batteries is melted to remove impurities and recycled into new lead-acid batteries.

Lead exposure carries risks

Even though lead has been historically cheap, abundant, and remarkably versatile, it is a poisonous metal that our bodies cannot use. Experts have warned for centuries of its

dangers. Nicander of Colophon, an Ancient Greek poet and physician, described symptoms of high lead exposure in the second century BCE. During the Renaissance, some experts noticed that painters, potters, and others who worked with lead suffered higher-than normal rates of muscle atrophy, stomach woes, fatigue, and weakness.

In the early 1800s, French physician Louis Tanquerel des Planches researched 1,200 lead poisoning cases. He discovered that being exposed to lead fumes was even worse than working with solid lead, in part because it caused brain damage. As study after study detailed the results of inhaling, ingesting, and handling lead, advocates for public health and workers' rights raised alarms.[2]

In the 1920s, a huge controversy erupted in the United States over sales of leaded gasoline. Many scientists warned that adding a known neurotoxin to gasoline was a serious menace to public health. But a government study funded by General Motors and DuPont stated that there was no danger of being poisoned by lead, even after long exposure to exhaust from cars using leaded gas. The Ethyl Corporation described the additive's discovery as a "gift of God" essential to American industrial progress. It blamed workers' "carelessness" for high rates of violent insanity and death at tetraethyl labs and refineries.[3]

Lead exposure is more than an occupational hazard for workers in certain industries. Scientists and doctors now know that young children are most at risk for lead poisoning. It can damage their rapidly-growing brains and stunt physical growth and development. Lead poisoning contributes to social, behavioral, and school problems. We all pay for these problems through public services for health care, special education, and behavioral interventions. Lead poisoning can affect future employment and reduce lifetime earnings.[4]

Even at low levels, lead accumulates gradually in human bodies and the environment. As adults age, their bones decalcify and release lead into their bloodstream. A growing body of scientific literature suggests a link between adult blood lead levels and dementia.[5, 6]

MORE KENT COUNTY CHILDREN ARE BEING POISONED BY LEAD

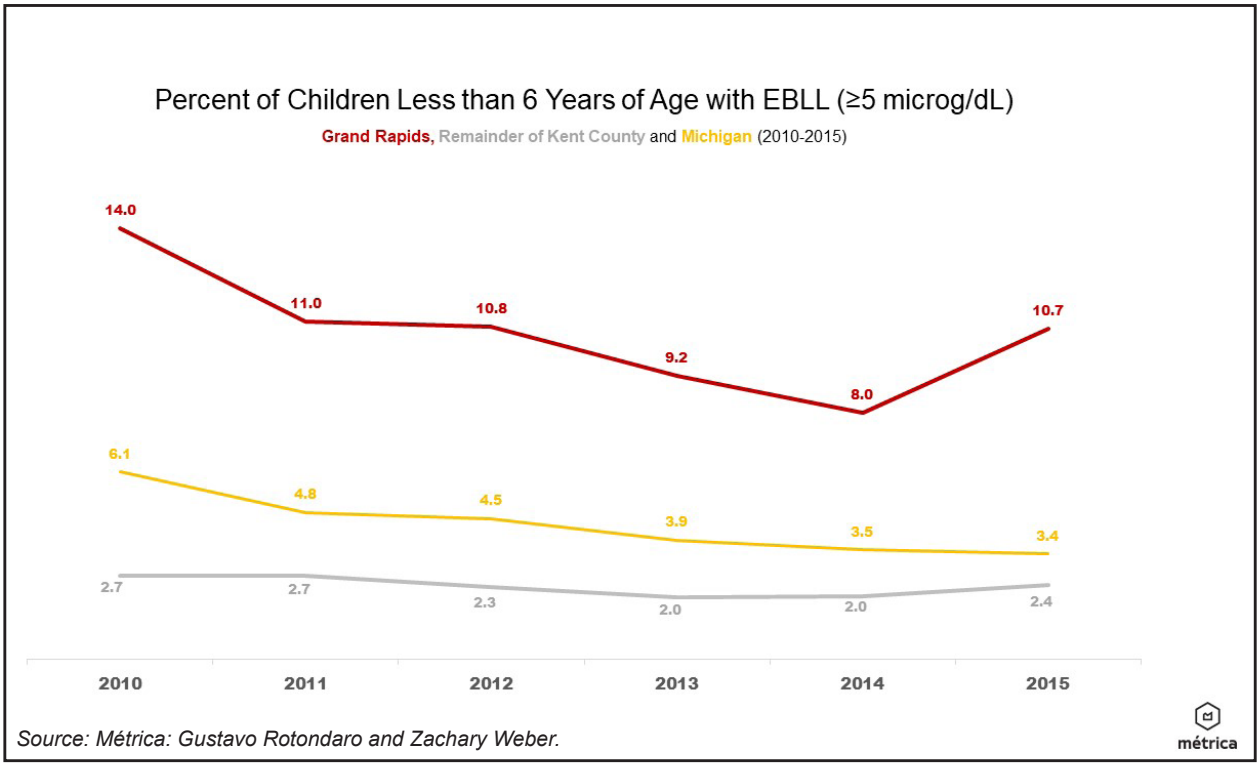
When you hear the phrase "lead poisoning," you probably think about Flint, Michigan. When news broke about Flint's water crisis, many people wondered whether Kent County's drinking water was safe from lead.

As the next chapter of this report explains, the City of Grand Rapids Water System regularly tests its water and meets or exceeds all water-safety testing requirements. It serves residential and commercial customers in Ada Township, Cascade Charter Township, City of Grand Rapids, City of East Grand Rapids, Grand Rapids Charter Township, City of Kentwood, Tallmadge Charter Township, City of Walker, and portions of Ottawa County.

Drinking water is not the main source of lead poisoning. Instead it is lead-based paint found in older homes and in bare soil around them. Four of five homes in Grand Rapids, and nearly three of five homes in Kent County, were built

before 1978, the year lead was banned from paint.

Childhood lead poisoning in Kent County has dropped more than 90% since 2001. That's because many public policies (mostly federal) were enacted to reduce lead exposure from lead-based paint, leaded gasoline, lead in foods and consumer products, and more. Those policy results were enhanced by many local organizations working together in the Get the Lead Out! partnership. But in 2014, 2015 and again in 2016, the number of lead-poisoned children rose in Kent County.



Source: Métrica: Gustavo Rotondaro and Zachary Weber.

The Kent County Lead Task Force was formed to investigate this problem. Although lead poisoning is worst in three Grand Rapids zip codes, the problem isn't confined to urban areas. The only way to confirm lead exposure and poisoning in children is to test their blood.

Highest rate in Michigan

The amount of lead in blood is referred to as blood lead level (BLL). BLL is measured in micrograms of lead per deciliter of blood (ug/dL). In children under age 6, a BLL of 5 or more is enough to cause neurological damage and learning disabilities. Children who test at ≥5 BLL have elevated blood lead levels above the current reference level of the

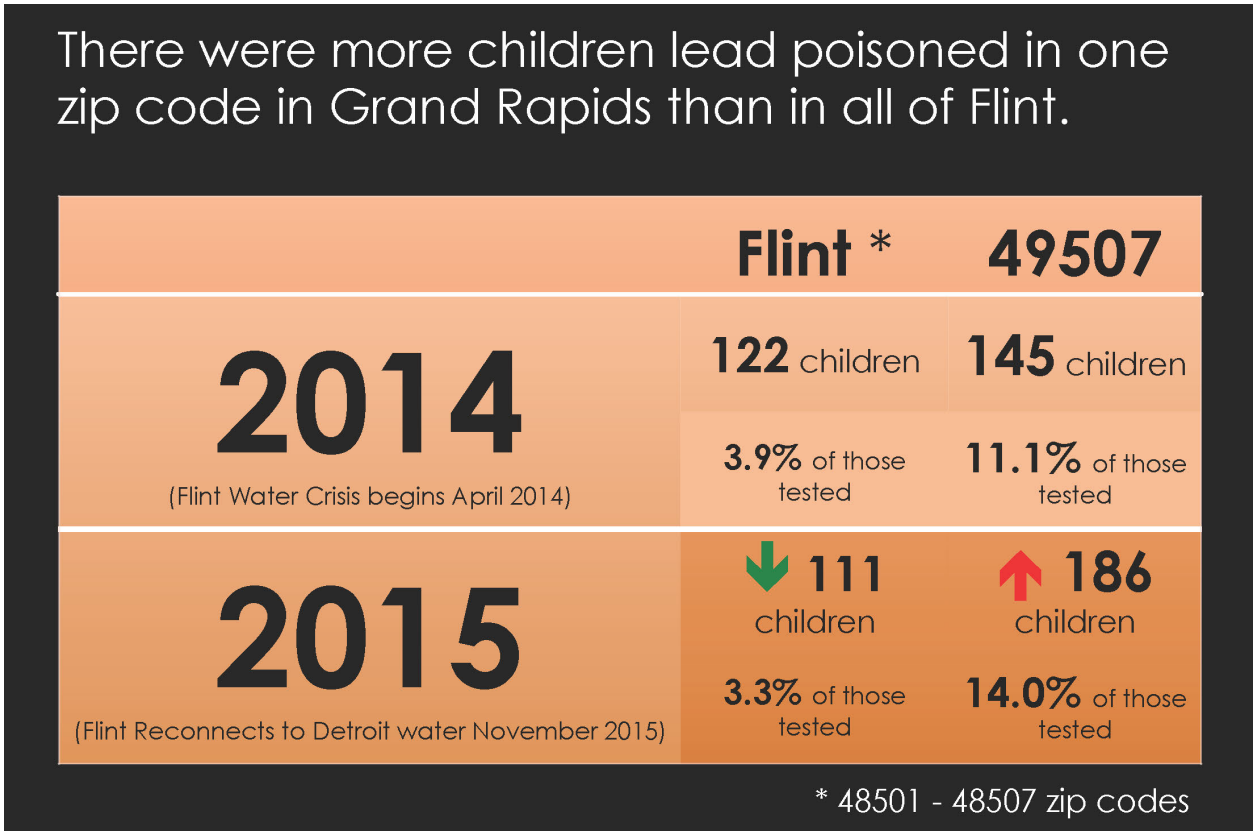
49507 zip code

national Centers for Disease Control and Prevention (CDC). No level of lead in the blood has been identified as safe.[7] In this report, however, the phrase “lead poisoned” refers to ≥5 BLL.

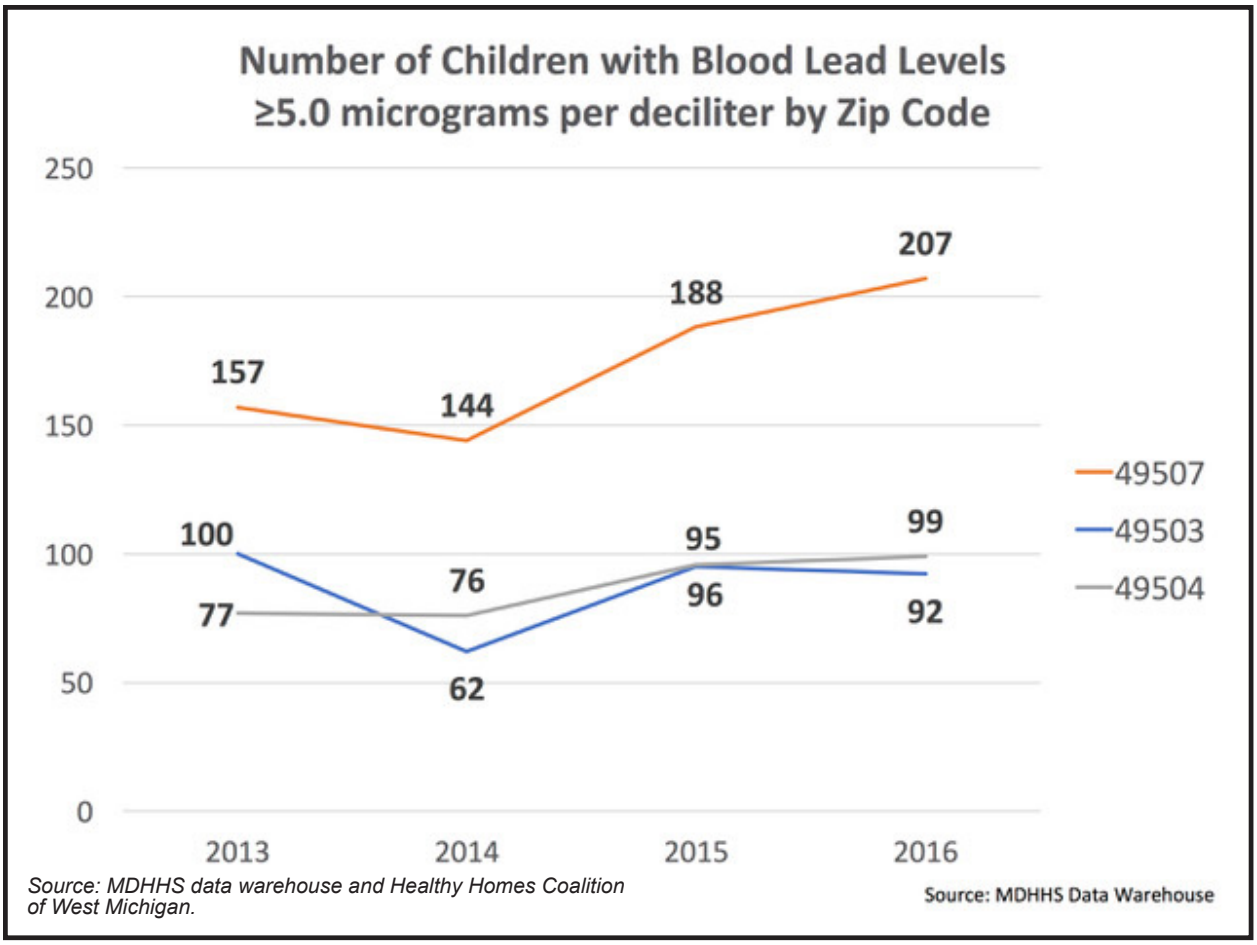
Not every Kent County child under age 6 is tested for lead. In 2015, there were 610 children who tested at ≥5 BLL. Of these, 498 children, about 80%, were 1 or 2 years old. Lead exposure at this age can affect ability to crawl, walk, and play.

Kent County’s 610 lead-poisoned children represented 6.2% of all its kids under age six who received a blood lead test.[8] This was far worse than the 2015 rate for Michigan (3.4%) or the U.S. (3.3%). In 2016, Kent County had 617 lead-poisoned children. Hundreds more are exposed each year.[9]

No Michigan zip code had more lead-poisoned children in 2015 or 2016 than the Grand Rapids 49507 zip code. Poisonings there increased 40 percent from 2014 to 2016. Those figures come from Michigan Department of Health and Human Services (MDHHS). More children were poisoned by lead in 49507 than in all of Flint before, during, and after its water crisis, according to a Michigan Department of Health and Human Services data report.



The Grand Rapids zip codes of 49507, 49503, and 49504 accounted for two-thirds of Kent County’s lead-poisoned children in 2016. Subject matter experts who presented to the Kent County Lead Task Force explained that lead poisoning happens most often among low-income children living in older homes, especially poorly-maintained or rental units.



Métrica consultant Gustavo Rotondaro and data analyst Zachary Weber pulled data from MDHHS, Kent County Bureau of Equalization, and City of Grand Rapids building permits. They found that in 2015, children with ≥5 BLL were four times more likely to live in homes built before 1940. Between 2010 and 2015, such children were five times more likely to live in homes where state equalized value was less than $40,000.[10]

CDC reports that children living at or below the poverty line in older housing are most at risk for lead poisoning. The percentage of black children with elevated blood levels is more than twice that of white children according to MDHHS data.

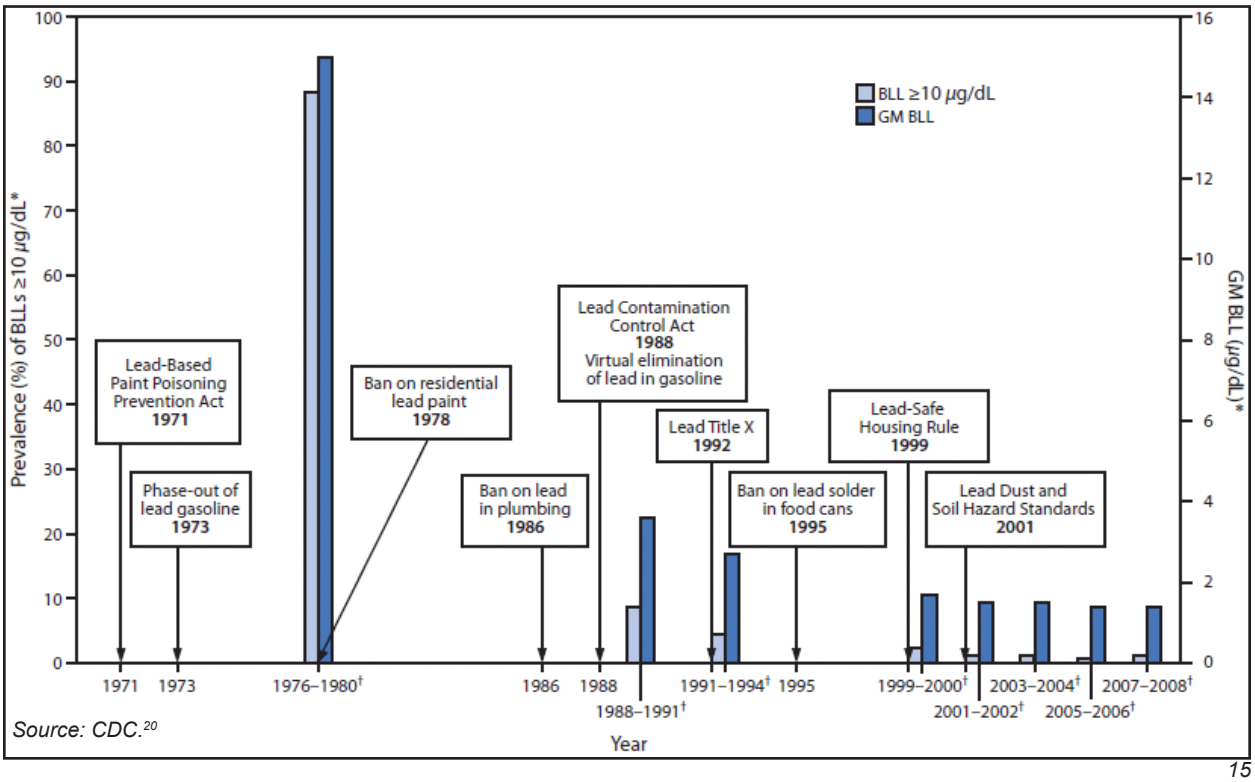
But it's not only low-income urban children who get poisoned by lead. Remember that housing age is a big risk factor. Nathan Schall, a Kent County community development intern, used U.S. Census Bureau data to find houses built before 1960. Among the 38 units of local government in Kent County, the percent of housing units built before 1960 ranged from 7.1% in Cascade Township to 75.6% in East Grand Rapids. The suburban or rural areas with the highest percent of housing built before 1960 are Sand Lake (54.3), Kent City (45), Sparta (42.9), Lowell (40.8), and Caledonia (39.2).[11]

What counts as lead poisoning

One challenge in talking about lead poisoning is that the notion of "safe," "normal," or "concerning" blood lead levels keeps changing. The level at which CDC recommends medical intervention has dropped several times for two main reasons. First, laboratories developed more accurate ways to measure lead in blood samples. This let researchers more confidently compare and analyze test data. More importantly, new studies by health researchers, economists, anthropologists, and other experts have increased understanding of how lead exposure and lead regulations affect children, adults, and society.

Here's a sampling of influential studies and findings:

- Geochemist Clair C. Patterson spent his life crusading against environmental lead contamination and human lead poisoning. He examined ancient human skeletons to show that modern humans have up to 1,000 times more lead in their bodies than preindustrial humans did.[12, 13, 14]
- Herbert L. Needleman, a pediatrician and researcher, showed that even low levels of lead exposure were correlated with decreased children's IQ and classroom performance.[15]
- Economist Rick Nevin demonstrated the correlation between high blood lead levels and crime. Follow up studies showed the same pattern at work in seven nations.[16, 17]
- Phasing out leaded gas in 1973 and banning residential lead paint in 1978 dramatically reduced BLL. The Clean Air Act reduced national concentrations of lead in air pollutants by 85% between 1990 and 2015. Other regulations helped too. Among children between the ages of 1 and 5, the median dropped from 15 BLL in 1976 to 0.7 BLL in 2014.[18, 19]



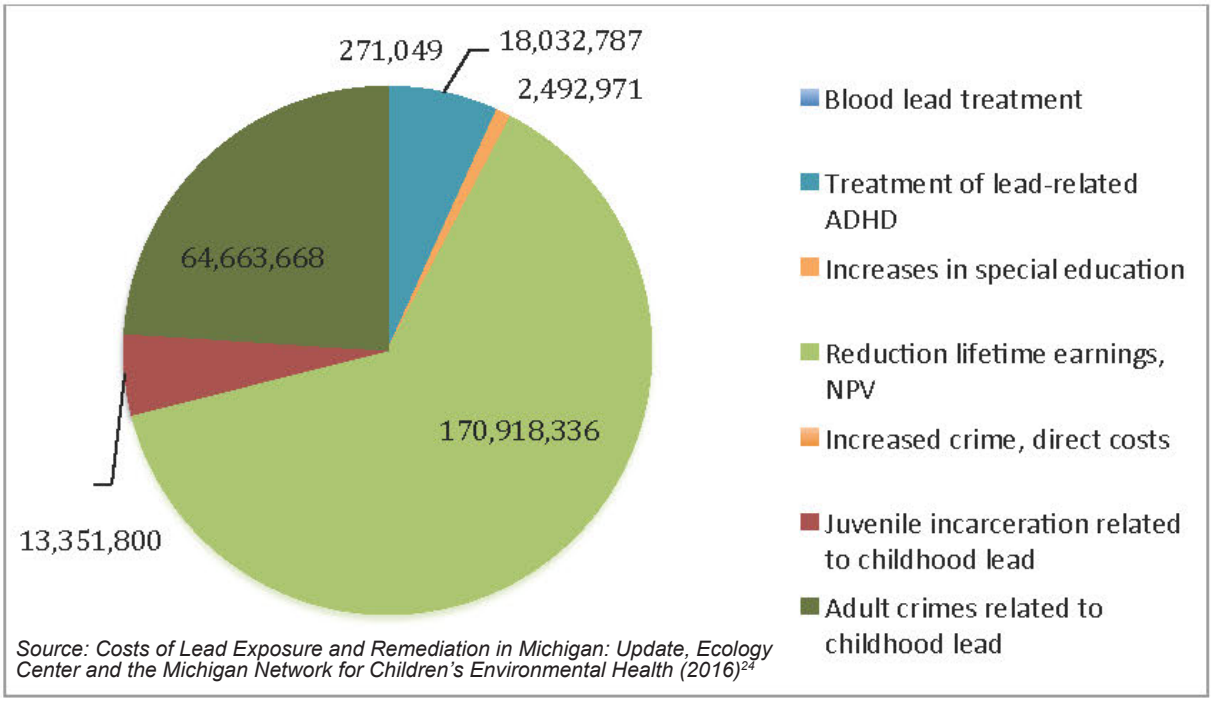
Source: CDC.[20]

In the early 1960s, public health officials defined lead poisoning as ≥60 BLL. That's when children would show symptoms such as seizures, abdominal pain, or extreme lethargy. Community-wide screening for testing blood lead levels wasn't widely available until the 1970s. The rise of computerized records helped researchers begin to understand that lead is also a silent poison. The CDC dropped its blood lead "level of concern" for children under 6 to ≥25 BLL in 1985. It dropped again to ≥10 BLL in 1991. "Level of concern" meant that medical intervention was recommended. Doctors didn't necessarily inform parents whose children tested <10 BLL. In 2012, CDC replaced the term "level of concern" with "reference level" and said that case management should start at ≥5 BLL for children under age 6.

It's important to note that this standard doesn't mean that lower BLL are safe. Rather, the CDC assesses the reference level every four years. It uses the two most recent sets of National Health and Nutrition Examination Survey children's blood lead distribution. It sets the reference level at the 97.5th percentile of BLL. This means that 2.5% of kids test above the reference level BLL. It does not mean that a <5 BLL is safe.[21, 22, 23]

The reference level in 2014 was ≥5 BLL. Yet, a well-documented report estimates that lead exposure costs in Michigan in 2014 topped $271 million. About $112.5 million of that was borne by taxpayers.

Summary of Costs Associated with Lead Exposure, 2014



Source: Costs of Lead Exposure and Remediation in Michigan: Update, Ecology Center and the Michigan Network for Children's Environmental Health (2016)[24]

By now, the official position from the World Health Organization and on down through national, state, and county levels, is that there is no safe level for lead in blood. But governments, public health departments, and physicians need guidelines to decide what to do and when. Chapter 3 explains the current model for how children are identified for testing and treatment. Chapter 4 details the current model for making homes lead safe.

Even though the American Academy of Pediatrics says that no blood lead level is considered safe for children, Dr. Bryan Judge is concerned that this message may be misconstrued. Judge works in medical toxicology at Spectrum Health and teaches emergency medicine at Michigan State University College of Human Medicine. He cautioned the lead task force not to overstate the impact of the lead poisoning problem on individuals who are lead poisoned by today's standards. For example, in the years 1976 to 1980, U.S children aged 1 to 5 years had a median 15 BLL. Judge said he's treated many lead-poisoned children who've gone on to live healthy productive lives, including earning college and graduate degrees. He questions whether limited healthcare dollars should focus on low BLL.

Judge also said that studies linking high BLL to crime or permanent IQ loss can stigmatize lead-poisoned children. He advised assuaging parents' fears by reminding them of factors that can counteract lead's impact, such as better nutrition and nurturing parenting.

Chapter 2: SOURCES OF LEAD IN KENT COUNTY

Drinking water is not the main source of lead contamination in Kent County. The chief culprit is lead dust in older homes and the bare soil around them. Other sources usually play a minor role. Young children are the most vulnerable to lead poisoning. Their risk factors are cumulative and synergistic.

IT'S NOT OUR MUNICIPAL WATER SYSTEM

The water situation in Kent County is far better than in Flint. That's true whether you look at the Grand Rapids Water System or other types of water supplies. The Kent County Health Department's environmental health division monitors every type of water supply not overseen by the State.

Difference between Grand Rapids and Flint

When news broke about Flint's water crisis, many people wondered whether Grand Rapids' drinking water is safe. It is. Joellen Thompson and Eric DeLong explained why in their presentation to the Kent County Lead Task Force.[1] Thompson was the City of Grand Rapids Water System manager, and DeLong is the Grand Rapids deputy city manager.

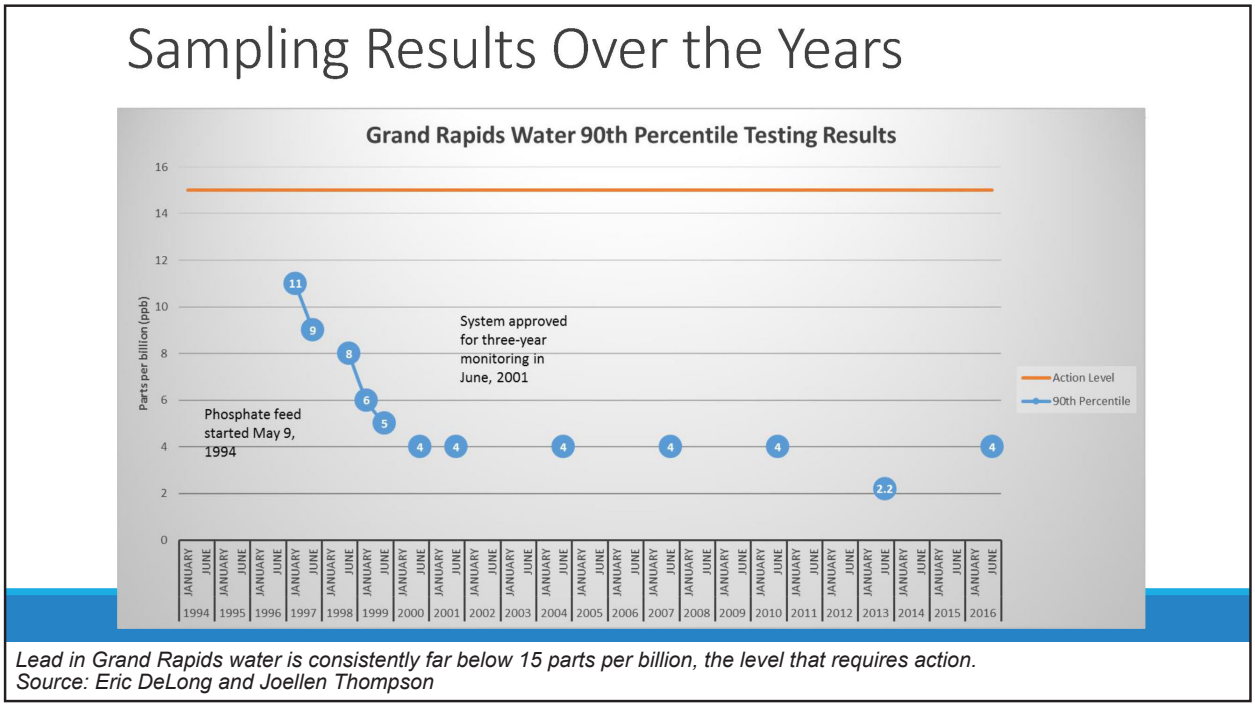
The Grand Rapids system covers 137 square miles. It delivers clean, safe drinking water to about 280,000 residential and commercial customers in Ada Township, Cascade Charter Township, City of Grand Rapids, City of East Grand Rapids, Grand Rapids Charter Township, City of Kentwood, Tallmadge Charter Township, City of Walker, and portions of Ottawa County.

Thompson and DeLong described the Grand Rapids system's water source, treatment, and proactive approach to regulations and concerns. The lead task force also reviewed the final report of the Flint Water Advisory Task Force. Its executive summary begins: "The Flint water crisis is a story of government failure, intransigence, unpreparedness, delay, inaction, and environmental injustice."[2]

Flint water problems began when state-appointed emergency managers decided to switch water sources to save money. Flint's water was fine while it came from the Detroit Water and Sewage Department, which draws from Lake Huron. The new plan called for drawing primarily from the Flint River. The Grand Rapids system has drawn water from Lake Michigan since the 1940s. It has never switched sources and has no plans to do so.

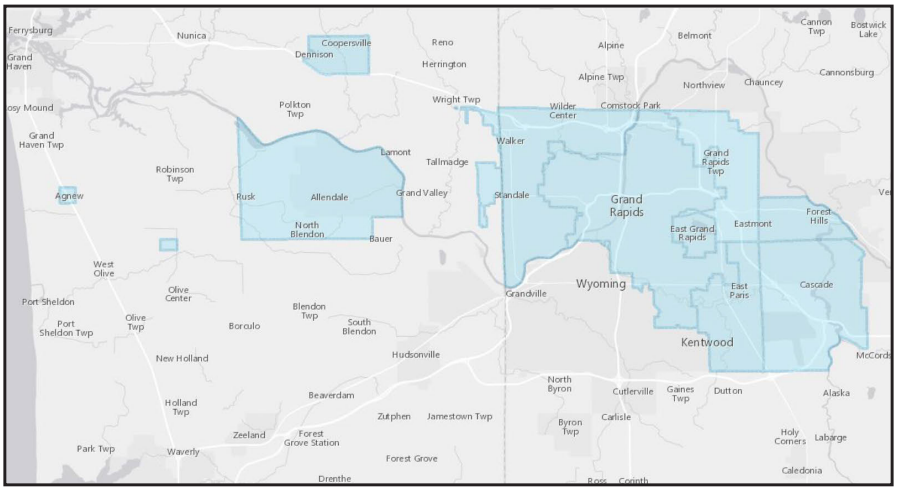
Flint River water was already known as poor quality, difficult to treat, and highly corrosive to iron pipes and lead solder.[3] Yet the Flint water treatment plant failed to adequately test the river water before supplying it to homes and businesses. Nor did it apply adequate corrosion control, as required under EPA's Lead and Copper Rule. By contrast, Grand Rapids has added phosphates to water since 1994. This coats pipes and interior plumbing to prevent lead from leaching into drinking water.

Grand Rapids Water System staff have decades of experience in testing water samples. As required by law, they meticulously test and monitor water, including taking samples from homes with lead service lines. The Grand Rapids system meets or exceeds all water-safety testing requirements under the federal Lead and Copper Rule. After hearing about Flint, the Grand Rapids system created a helpful Q & A to answer consumer concerns.[4] The Grand Rapids Public Schools system had all its 54 buildings tested to confirm their water was safe from lead. It was.



Lead in Grand Rapids water is consistently far below 15 parts per billion, the level that requires action.
Source: Eric DeLong and Joellen Thompson

"Our consistent test results show that our lead levels—2.2 parts per billion in the 90th percentile—are among the lowest in Michigan," DeLong told the lead task force.



Grand Rapids Water System serves the blue area.
Source: Eric DeLong and Joellen Thompson

Beyond the Grand Rapids Water System

The map to the left shows that many parts of Kent County don't get their water from the Grand Rapids system.

Eric Pessell, Kent County environmental health director, explained to the lead task force how water supply systems are monitored.[5] Michigan's 1976 Safe Water Drinking Act classifies drinking water into public (Type I, II, and III) and private water supplies.[6]

The Michigan Department of Environmental Quality regulates Type I systems. All Type I water systems must provide customers with an annual Consumer Confidence Report about water tests. County health departments regulate Type II and Type III systems. Action is required when water samples show at least 15 parts per billion (ppb) lead concentration, except in schools, where the limit is 10 ppb.

Type I: Community public water systems supply year-round to at least 25 residents or 15 living units. Examples include municipalities, apartments, nursing homes, and mobile home parks.

Type II: Non-transient, noncommunity public water serves at least 25 of the same people for at least six months each year. Examples include schools, industries, and workplaces. Pessell said Kent County has 52 of these. They must be stringently sampled because people drink the water so often.

Type II: Transient, noncommunity public water serves at least 25 people or 15 connections for at least 60 days per year. Examples include campgrounds, hotels with less than 25 employees, or rural gas stations that serve fountain drinks and coffee. Pessell said Kent County has 283 of these. They're not as highly regulated and not required to do any testing. However, Kent County Health Department identifies sites likely to serve pregnant women and young children, such as churches or daycare facilities. "We can only recommend testing, but they usually do it," Pessell said.

Type III: Public water supply not considered Type I or Type II. Examples include small apartment complexes, condominiums, and duplexes.

Private: Private water supply for a single family home. Kent County issues permits to drill private groundwater wells and inspects wells after they're built. Ongoing testing regulations don't apply to these wells, but the Centers for Disease Control and Prevention (CDC) advises homeowners to test their well water at least once a year.

The Kent County Health Department Laboratory provides water sample collection kits for free. In 2017, it charged $18 to test a water sample for lead. Kent County's two other state-certified labs for testing water for lead and copper are Prein&Newhof, a civil and environmental engineering firm, and Pace Analytical Services, a sampling and analytic testing firm.

Pessell estimated that in 2016, less than 10 water samples tested ≥15 ppb for lead. Lead levels dropped after water operators improved corrosion control or replaced lead service lines or old plumbing fixtures.

Asked whether groundwater is a local source of lead contamination, Pessell said it is not. Back before people knew better, they improperly disposed of leaded gas, leaded paint, and lead-acid batteries. This lead can leach out, but doesn't get washed into groundwater except by acid rain. Instead the lead binds tightly to soil, where it remains as a main source of contamination.

Water standards not the same as health standards

Paul Haan, director of Healthy Homes Coalition of West Michigan, served on both the lead task force and Michigan's Child Lead Poisoning Elimination Board. The latter was formed to respond to children being lead poisoned by exposures other than the Flint water system. Haan often notes that we in Kent County can be thankful that our municipal water system is fully compliant with rules and standards. The Kent County Health Department educates and advises Type II and Type III water system operators as well as private well owners. It pays special attention to water sources used by pregnant women and young children.

Yet Haan explains that there's a difference between water system standards and healthbased standards. Water system operators take specific actions when lead levels reach a certain concentration. But no amount of lead has been shown to be absolutely safe for humans to ingest.[7]

Also, a water system can deliver safe clean water, but "that doesn't answer the question of whether the water system is protective of human health at the end of the tap," he says. For example, the home may have corroded plumbing or lead solder in pipes, fixtures, faucets, and fittings. Renovation can jar anti-corrosion coating or lead in service lines. (Later chapters will address the issue of lead service lines between the shutoff box at the property edge and the dwelling.)

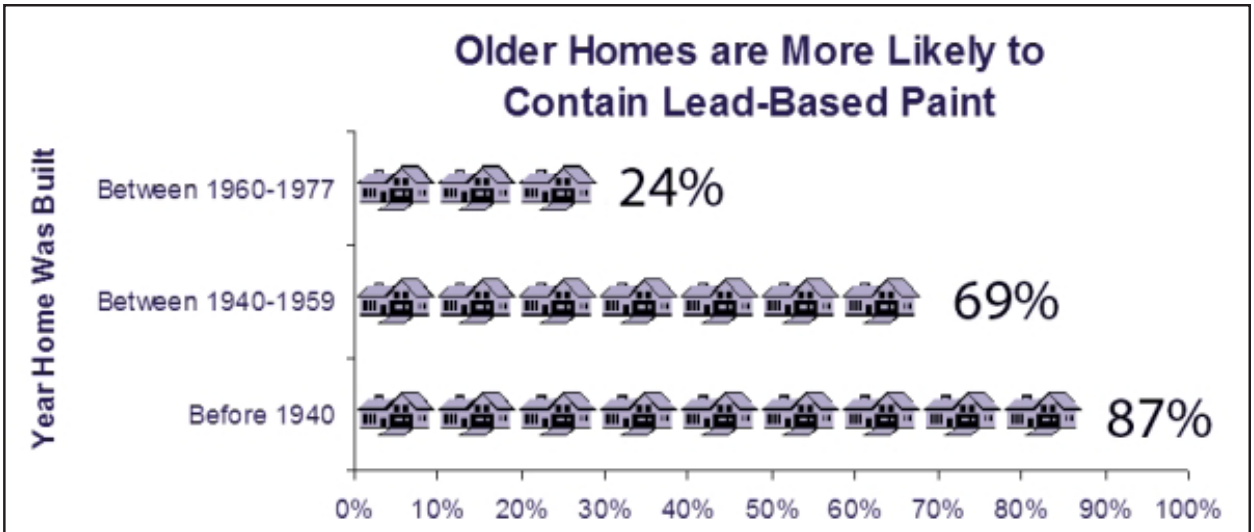
LEAD DUST IN HOMES AND SOILS

Drinking water is not the main source of lead contamination in Kent County. Instead it is lead-based paint and dust found in older homes and in bare soil around them. Four of five homes in Grand Rapids, and nearly three of five homes in Kent County, were built before 1978, the year lead was banned from paint. Other sources also contribute to lead poisoning. However, Healthy Homes Coalition states that about 90% of all childhood lead poisoning cases in Kent County result from deteriorating lead-based paint and lead dust.[8]

Lead paint in older homes

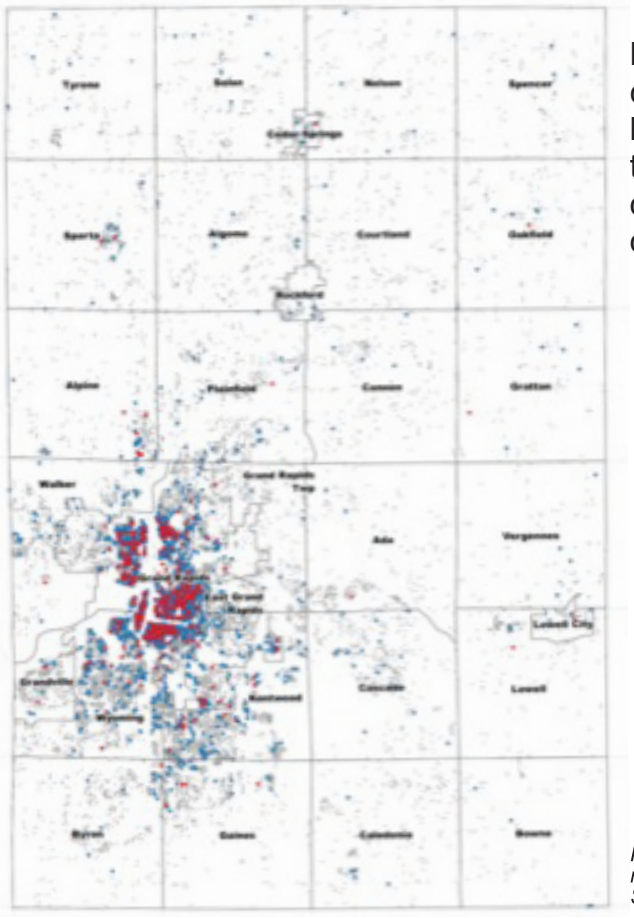
Lead paint is the main source of lead in older homes. It doesn't take much lead to make paint poisonous—just half of one percent by weight (0.5%). But lead makes paint dry faster. It makes interior paint washable and durable, so people can scrub their walls. Lead paint protects exterior wood from rotting and metal from rusting. Residential lead paint is still sold in or exported by many countries.[9]

France, Austria, and Belgium banned interior white-lead paint already in 1909. The League of Nations, the forerunner of United Nations, banned lead-based paint in 1922, but the U.S. didn't adopt that rule.[10] Residential lead paint sales didn't end in the U.S. until 1978. By then latex water-based paints had taken over the market.

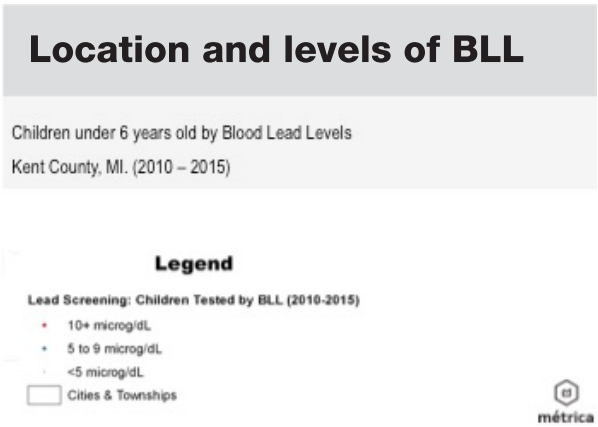


The older the home, the more likely it contains lead paint.
Source: EPA: www.epa.gov/lead/protect-your-family-exposures-lead

The EPA says that when lead paint is completely covered by newer paint, it's generally not a problem.[11] But friction from opening and closing windows and doors makes paint crack, chip, or peel. This friction exposes lead layers. Dampness in kitchens and bathrooms weakens paint and exposes lead layers, especially on old plaster walls. These situations create lead paint chips and lead dust.



Lead dust falls to the floor and gets on children's hands and toys. It gets into their bodies when children put hands or toys in their mouths. Some children gnaw on windowsills. The EPA says that just one gram of lead dust spread over 25,000



Kent County children tested in older neighborhoods are more likely to have elevated blood lead levels.
Source: MDHHS Data Warehouse and Métrica

square feet of flooring is hazardous for young children. Paul Haan breaks it down this way: “The amount of lead dust equivalent to a Sweet’N Low packet is enough to contaminate twelve homes in Grand Rapids.”

Legacy of lead paint and leaded gas in soil

Many older homes no longer have exteriors covered in lead paint. But remnants of previous layers too often infest bare soil around the house. Either the paint flaked off through age or painters scraped it off before applying a new coat.

The EPA’s Lead Paint Renovation, Repair and Painting Rule went into full effect in 2010. It requires that renovators must be trained and certified in lead-safe practices—and use them—to perform any renovation, repair, or painting that disturbs lead-based paint. The rule applies to any compensated work on homes, child care facilities, and preschools built before 1978. This includes properties where rent is collected. But landlords often ignore the rule, and it doesn’t apply to homeowners doing their own work.[12]

The result is that when people walk, play, or garden in lead-infested bare soil, they get it on their hands, or track it into the house.

Back when motor vehicles used leaded gas, the exhaust spread lead through the air. It settled onto food crops and into soil. There’s far less lead in our food supply, now that leaded gas and leaded solder in food cans aren’t allowed. But, even though leaded gas has been banned since 1988, vast amounts of lead remain in soil. That’s especially true within 80 feet of busy roads, according to a CDC report on preventing lead poisoning in children.[13]

That report states: “Since lead does not dissipate, biodegrade, or decay, the lead deposited into dust and soil becomes a long-term source of lead exposure for children. For example, although lead emissions from gasoline have largely been eliminated, an estimated 4-5 million metric tons of lead used in gasoline remain in dust and soil, and children continue to be exposed to it (ATSDR, 1988).”[14]

OTHER LEAD CONTAMINATION SOURCES

Adult occupations and hobbies, imported products, and renovation sometimes expose children to lead.

Plumbers, welders, remodelers, battery manufacturers, and many others get exposed to lead at work. They may bring home lead dust on their work clothes. Certain hobbies create lead exposure, such as making stained glass, reloading bullets, or shooting at indoor ranges.[15]

Imported cosmetics, foods, folk remedies, pottery, and toys may contain lead. Traditional eyeliners from Africa, the Middle East, and India, such as kohl, kajal, surma, and tiro, are used as eyeliner even for babies. The FDA prohibits them, but they still appear in online and specialty markets.[16] Two popular Hispanic folk remedies, Greta

and Azarcon, are fine orange powders that sometimes contain 90% lead. Also known as Alarcon, coral, luiga, maria luisa, or rueda, they are used for teething babies or for treating upset stomach, constipation, diarrhea, and vomiting.[17]

Remodeling and renovation often create lead dust, especially sanding, cutting, and replacing windows or dealing with old pipes, faucets, and fixtures. In areas with extensive construction or reconstruction, heavy machinery sometimes shakes the ground. This action can release particulate matter, which can raise lead exposure and increase soluble lead in water. Sometimes after street repair has shaken homes, people remove their faucet aerators and find visible lead particulates.

YOUNG CHILDREN ARE MOST AT RISK

Young children are most vulnerable to lead exposure. And the risk factors are cumulative and synergistic. Unfortunately, this means that lead poisoning is likely to have more impact on young children who also have other factors working against them.

Vulnerability, growth stage, and behavior

Their life stage and behaviors make young children most vulnerable to lead exposure. Their brains and nervous systems grow most rapidly between conception and age 3. About 90% of brain development occurs by age 5. Young growing bodies absorb more lead than adults absorb. This poisonous heavy metal can affect nearly every system in the body, but does its most damage to the brain, nervous system, and internal organs.[18]

Pregnant women with elevated blood lead levels pass it through the placenta to the developing fetus. These moms are at greater risk to miscarry or give birth to children early or underweight.

Most babies depend on breast milk and/or formula for their first six months. Babies who drink powdered formula mixed with water take in more water than older children do. If their drinking water has lead in it, they're more at risk to have elevated blood lead levels.[19]

Exposure to lead dust soars once infants and toddlers start putting their hands and toys in their mouths, crawling, and walking. The World Health Organization states that when children take in lead through their mouths, their gastrointestinal systems absorb about 50% of the lead—compared to 10% for adults.[20]

Risk factors are cumulative and synergistic

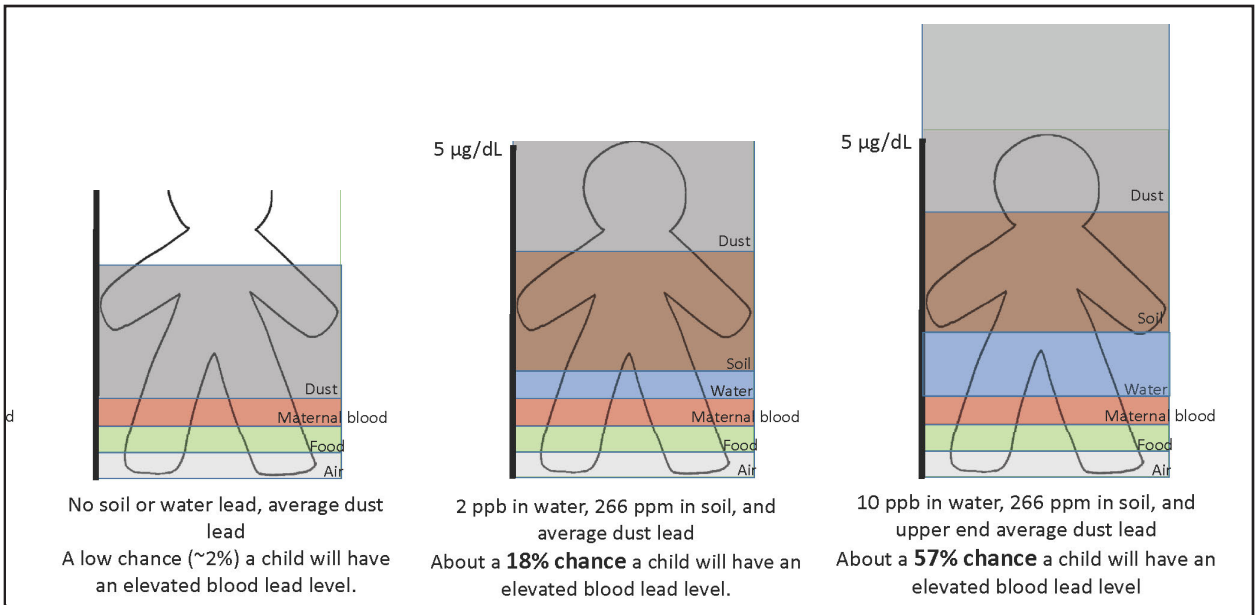
Kory Groetsch described to the lead task force how various lead sources accumulate in a young child's blood. He is Michigan's director of environmental public health. Groetsch shared a presentation developed with toxicologist Jennifer Gray.

He said that lead-contaminated dust and lead-contaminated soil are the most common sources of childhood lead exposure. That's why reducing exposure to lead dust and leaded soil is essential to reduce Kent County children's BLL.

Groetsch explained that the EPA has created a model to predict how various sources raise BLL. This integrated exposure uptake biokinetic model is possible because scientists know how to identify and measure isotopes. An isotope is a variant of a chemical element, and each lead type has a different isotope. This means that scientists can tell how much lead in someone's blood comes from air, food, maternal blood, water, soil, or dust. The model doesn't factor in whether a child has eaten paint chips or swallowed lead particulates from drinking water.[21]

EPA investigators developed their model by visiting homes and taking soil and water samples. They used floor wipes to calculate average dust lead levels. The images below show various ways that lead exposure can result in a ≥5 BLL in a child.

Groetsch, other subject matter experts, and lead task force members in health-related jobs all emphasized that risk factors for BLL are cumulative and synergistic. For example, consider two families who live in older homes with the same levels of lead dust. The wealthier family has some protective elements that the poorer family doesn't have. For example, eating enough calcium and iron reduces lead uptake.[22] But the wealthier family is more likely than the poorer family to have the money, transportation,



Impact of lead sources on a child's blood lead levels. Source: 04/19/17 presentation Source contribution to childhood lead exposure, Kory Groetsch, MS, environmental public health director, Jennifer Gray, PhD, toxicologist, division of environmental health, MDHHS

and access to good grocery stories and good nutrition.

Lead exposure is higher among children with lower socioeconomic status. That lower status itself compounds the risk.[23] The World Health Organization cites several observational and experimental studies to show that the same level of exposure causes

greater injury in people subject to chronic stress. In other words, the chronic stress of dealing with poverty, unsafe neighborhoods, and racial issues changes body chemistry. It can increase inflammatory hormones that injure immune systems.[24, 25, 26]

Chapter 3: CURRENT MODEL: TEST ONLY SOME CHILDREN

BLL means blood lead levels. Elevated blood levels are currently defined as ≥5 BLL, which means 5 or more micrograms of lead per deciliter of blood (ug/dL). This amount is sometimes referred to as elevated BLL or simply EBL. Children who test at this level are considered lead poisoned.

Only some Kent County children under age 6 get tested for lead in their blood, because the current model focuses on children considered most likely to be poisoned. Kent County is now the third worst county in Michigan for lead poisoning rates. This chapter describes testing, treatment and follow up. It explains that the current model needs to shift, so we can prevent lead poisoning from happening in the first place.

WHO GETS TESTED AND HOW

Throughout Michigan, including Kent County, the children most likely to be tested for blood lead levels are enrolled in Michigan Medicaid. That's because they're considered to be at increased risk for lead exposure and poisoning and because Michigan Medicaid requires all children to be tested once by age 3. The MDHHS statewide screening and testing plan recommends testing Medicaid-enrolled children at 12 and 24 months of age. It recommends that children between 36 and 72 months who were not previously tested be tested at least once.[1]

Michigan requires blood lead testing for all children under age 6 in the Woman, Infants, and Children (WIC) program. Kent County Health Department (KCHD) does universal testing in its WIC clinics.

MDHHS keeps detailed BLL records by age group, Medicaid enrollment status, county, and zip code.[2] Unfortunately, there's often a two-year lag between when testing happens—for Medicaid and non-Medicaid children—and when county and zip code results are analyzed, confirmed, and made public.[3]

Analyzing data drawn from Michigan Department of Health and Human Services (MDHHS) and DataUSA[4] yields two striking insights. The BLL statistics below are from 2015, the most complete annual data available. All describe children under age 6.

First, let's compare Kent County to statewide results for all children. Like the Michigan statewide average, Kent County tested 18.4% of its children in 2015.[5] That year Michigan had 4,791 (3.4%) tested children with EBL.[6] However, Kent County had 610 (6.2%) tested children with EBL. Only Lenawee County (10%) and Mason County (6.5%) had worse results.[7]

Kent County tested the same percent of its Medicaid-enrolled children (71.2%) as Michigan did.[8] But Kent County had 7.4% (531 Medicaid children) with EBL—compared to the statewide Medicaid-enrolled rate of 4% with EBL.[9]

Second, within Kent County, there's a huge difference in testing rates and results between Medicaid-enrolled children and children without Medicaid. Of the 9,780 children tested in 2015, 73.4% were on Medicaid. These tested Medicaid children accounted for 87% of Kent County's EBL results.

Kent County has four times as many children without Medicaid compared to those who have it. Only 2,595 of non-Medicaid children were tested, and 79 (3%) had EBL. The small segment who got tested accounted for only 6% of Kent County's 43,146 children under age 6 who didn't have Medicaid in 2015.[10] If only 1% of the untested non-Medicaid children had EBL, then the county would know whether a projected 431 more children need treatment. Instead, lead slowly and silently accumulates in their bodies and keeps contaminating their environment.

THE BIG QUESTION

So why has lead poisoning started rising again here? Kent County Lead Task Force members and subject matter experts discussed and discarded many possibilities. It is not the result of contaminated water, combined sewage overflows, increased healthcare coverage, or more children getting tested. Instead, the task force concluded two things are happening as the local housing market tightens. More homes are being renovated, but remodelers don't always use lead-safe practices. Also, people are getting priced out of safer homes and into older, poorly-maintained dwellings. Both factors result in more exposure to lead dust in homes and bare soil.

Why so few children get tested for blood lead levels

William Bush, pediatrician-in-chief at Helen DeVos Children's Hospital, told the lead task force why BLL testing is far from universal in Kent County.

- His office has two portable blood lead analyzers for doing capillary BLL tests with either a finger stick or heel prick. Many doctor's offices do not have such machines. Their patients must go to KCHD or an offsite lab for the capillary BLL test.
- Pediatricians sometimes assume that if families have decent incomes, then their children won't have EBL. "Our office tests every child. We've had children in East Grand Rapids with EBL. Some were exposed during home renovation. Also, even really clean older homes can have lead paint dust in the corners of hardwood floors," Bush said.
- Many insurance carriers don't require pediatricians to test for lead, and they reimburse little or nothing for test costs.[11]

Children's blood lead levels tend to increase rapidly from 6 to 12 months of age and tend to peak at 18 to 24 months of age.[12] That's why Dr. Bush's office tests all children at 12 months. "But we do it already at 9 months if our lead screening questionnaire recommends it," he says.

He suspects that if more pediatricians used a lead screening questionnaire, then they'd recommend testing even for children not enrolled in WIC or Medicaid. MDHHS suggests

asking eight questions. If the parent answers yes or doesn't know the answer to any question, then the child should get a capillary blood test. If the parent answers no to each question, the child is probably not at risk for EBL.[13]

LEAD TEST SCREENING QUESTIONNAIRE

1. Is the child enrolled in Medicaid or on WIC?
2. Does the child live with anyone who has an elevated blood lead level?
3. Does the child live in or often visit a house built before 1950 that has peeling or chipping paint? This could include a daycare, preschool, or relative's home. Did the child do so in the recent past?
4. Does the child live in or often visit a house built before 1978 that has been remodeled within the last year? Did the child do so in the recent past?
5. Does the child have a brother, sister, or playmate with lead poisoning?
6. Does the child live with an adult whose job or hobby involves lead?
7. Does the child's caregiver use any home remedies that may contain lead?
8. Is the child an international adoptee, refugee, migrant, immigrant, or foster child?

Regarding the final question, children adopted from China or Russia had the highest BLL that Bush has seen.

How testing works

To first check for EBL, healthcare staff usually do a capillary test, because it's less invasive. They prick a child's heel or finger and blot the blood onto testing paper or into a capillary tube. Some pediatricians have a machine in their office to read results. The test can also be done at KCHD. You can get a false positive if you don't wash a child's finger or heel before poking it.

Any EBL result from a capillary test should be confirmed by a venous test, which means drawing blood from an arm vein. Doctors make referrals for venous tests to be taken at a lab, much like adults go to a lab for a cholesterol test.

If the venous test doesn't show EBL, then pediatricians should explain that the child's fingertip or heel might have been lead-contaminated. The parents should identify and eliminate the lead-contaminated source that led to a false positive. Remember that no level of lead in the blood is considered safe, not even if the test shows <5 BLL.

If the venous test confirms EBL, then it's important to test all other children who live or are cared for in the same environment.

As described in this report's first chapter, the Centers for Disease Control (CDC) changed terminology for how they refer to the level at which they recommend medical intervention and prevention. After years of calling it "level of concern," they began in 2012 to call it "reference level."

There's been a similar change in talking about "screening" for lead poisoning. For years, screening meant testing for lead in a child's blood, most often with a capillary test.

Pediatricians, healthcare providers, and public health officials used the words *screening* and *testing* interchangeably. But they also talked about using a lead screening questionnaire.

In 2016, the American Academy of Pediatrics (AAP) advised using the word *screening* only for the lead questionnaire. They recommended using the word *testing* for taking blood lead samples, whether by capillary or venous testing.[14]

TREATMENT AND FOLLOW UP FOR LEAD-POISONED CHILDREN

Michigan's Public Health Code requires all clinical laboratories and users of portable blood lead analyzers to submit all BLL results within five days after test completion. Michigan's Childhood Lead Poisoning Prevention Project keeps a public surveillance database of results. It uploads data to the MDHHS data warehouse and links records to each child's Medicaid data files and Michigan's immunization registry.[15]

KCHD receives data of children whose tests showed EBL. If the test was an unconfirmed (capillary) test, then KCHD nurse case managers visit parents to make sure children get a confirmed venous test. Nurses also share information on lead poisoning, prevention, nutrition, and more.

MICHIGAN Childhood LEAD POISONING prevention program

Blood Lead Level (BLL) Quick Reference for Primary Care Providers

Medicaid requires all children to be tested at 12 and 24 months of age. Children between 36 and 72 months who were not previously tested must be tested at least once.

	BEST PRACTICE	CONSIDERATIONS/ TREATMENT	RETESTING	PARENT EDUCATION & REFERRALS
NOT YET TESTED		Conduct risk assessment (see page 2 of this document). Test based on Medicaid requirements or risk assessment results.	Need for testing can be based on risk factors and Medicaid testing requirements	• Nutritional handouts • Safe cleaning handouts
BLL <5 ug/dL	Review lead level with family		• Retest in 6-12 months if child is at high risk • If child is less than one year of age at initial test, retest after first birthday	• Nutritional handouts • Safe cleaning handouts
BLL 5-14 ug/dL	• Confirm capillary result with venous test • Review lead level with family	• Consider other children who may be exposed • Conduct environmental history • Review diet/iron sufficiency • Provide nutritional counseling related to calcium and iron	Venous retest within 1-3 months to ensure BLL is not rising	• Nutritional handouts • Safe cleaning handouts • Refer family to local health department for nursing case management • Refer family to Lead Safe Home Program to determine eligibility for environmental investigation and abatement
BLL 15-44 ug/dL	• Confirm capillary result with venous test • Review lead level with family	• Consider other children who may be exposed • Consider evaluation such as an abdominal x-ray if leaded foreign bodies are suspected • Conduct environmental history • Review diet/iron sufficiency	• Venous retest within 4 weeks to ensure BLL is not rising • Repeat every 1-3 months until levels are <5	• Nutritional handouts • Safe cleaning handouts • Refer family to local health department for nursing case management • Refer family to Lead Safe Home Program to determine eligibility for environmental investigation and abatement
BLL 45+ ug/dL	• Confirm capillary result with venous test within 48 hours • Review lead level with family	• Consider other children who may be exposed • Any treatment at this level should be performed in consultation with MI Poison Control 800-222-1222 • Consider hospitalization and/or chelation • Family should NOT return to lead-contaminated home	• Confirm initial EBL with venous repeat within 48 hours • Treat as directed by expert • Monthly venous samples will be required	• Nutritional handouts • Safe cleaning handouts • Refer family to local health department for nursing case management • Refer family to Lead Safe Home Program to determine eligibility for environmental investigation and abatement

MDHHS Michigan Department of Health & Human Services

Revision Date: 4/17

Questions? Contact us at 517-335-8350
www.michigan.gov/lead

See **Blood Lead Risk Assessment** on other side.

If venous tests confirm EBL, KCHD nurses make up to six reimbursed (Medicaid) home visits. Joann Hoganson, KCHD director of community wellness, described these to the lead task force. “On home visits, the nurse gets down on all fours to test lead dust on the spot. We demonstrate lead-safe cleaning and explain how increasing iron, calcium, vitamin C, and zinc in the diet will make lead levels go down.

“We make referrals to social services and organizations that can help families get and pay for better nutrition and lead abatement. And we remind parents to get children’s blood retested after they’ve made changes. We see good results. Still, not everyone will let us in their house. We consider a case closed when a family declines services or we bring BLL below 5,” Hoganson said.

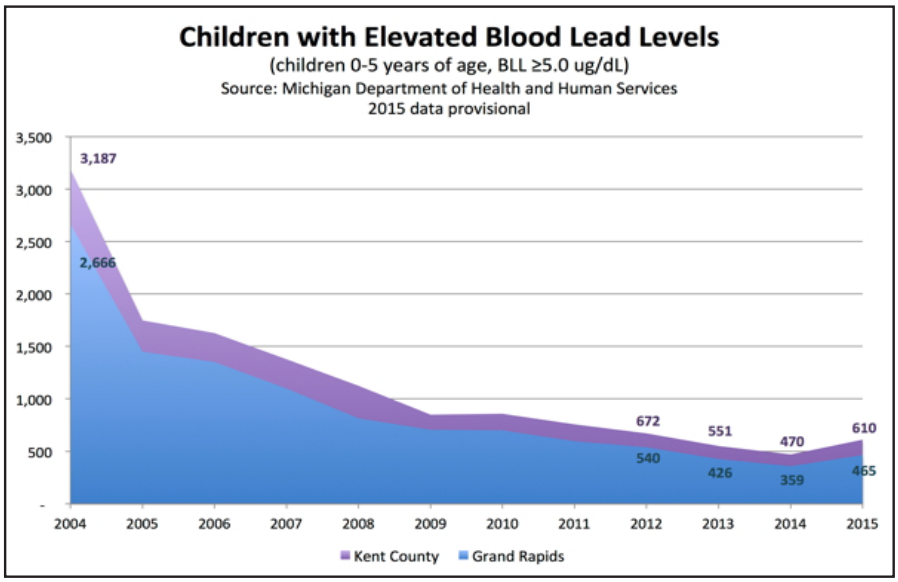
Several subject matter experts described why follow up is difficult. It’s hard to keep track of children when they move. Their new residence might have more lead hazards than where they lived when they last had a BLL test. Not every parent returns for follow up appointments or retests. Sometimes a child who tests positive at age 1 doesn’t come in at age 2, and perhaps the medical professional forgets to ask about lead when the child turns 3.

In Michigan, children need immunizations to enter school. Since BLL test records are tied to Michigan’s immunization registry, healthcare providers sometimes discover children who need case management. Of course, by then they may have had several years of lead exposure and poisoning.

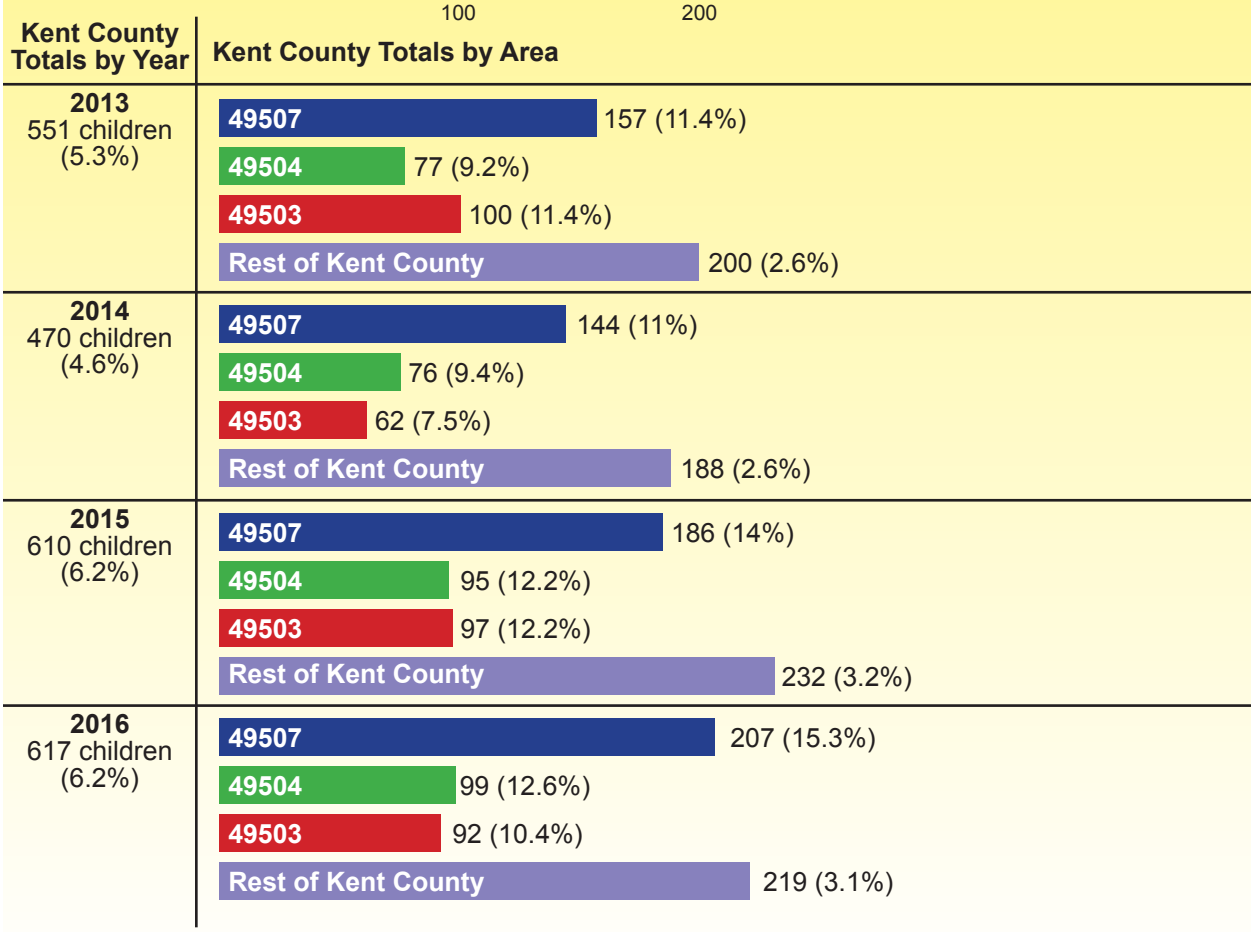
SECONDARY TREATMENT VS. PRIMARY PREVENTION

You need both a big picture and close focus to evaluate recent BLL increases in Kent County. If you look at results over many years, you see a success story worth sharing. Far fewer tested children have EBL now compared to a dozen years ago. In 2004, Kent County had 3,187 children under age 6 with ≥5 BLL. Ten years later, tests revealed “only” 470 lead-poisoned kids.

But whatever helped reduce lead poisoning isn’t working well enough anymore. The number and percentage of lead-poisoned local children have been rising again since 2014, especially in older Grand Rapids neighborhoods. And it would be higher if all children got tested, whether or not they receive Medicaid.



Number and percent of EBL in tested children under 6 by year and area*



Source: MHHSD data and provisional data and Healthy Homes Coalition of West Michigan

**The (x%) shows % of tested children with EBL (elevated blood levels) within that zip code or area. That's why they don't add up to 100%.*

Now is the time to switch paradigms from secondary treatment to primary prevention. Primary prevention means preventing lead exposure before it occurs, rather than responding to lead exposure after it has poisoned children. "We need to do more than use our kids as lead detectors," Paul Haan often says. He is the executive director of Healthy Homes Coalition of West Michigan.

Haan served on both the lead task force and Michigan's Child Lead Poisoning Elimination Board (CLPEB). In November 2016, that board issued a report, *A Roadmap to Eliminating Child Lead Exposure.*[16] The report lays out why Michigan needs to switch from secondary to primary prevention. Many organizations call for this paradigm shift, including World Health Organization, and, in the US, American Academy of Pediatrics, Centers for Disease Control, and Environmental Protection Agency.

Michigan Governor Rick Snyder acted quickly on the report's advice to re-form the temporary CLPEB into a permanent Child Lead Exposure Elimination Commission. The new commission recommends doing universal BLL tests for all Michigan children under age 6.[17]

Chapter 5 explains why it's better to test housing and environments first—to find and fix lead hazards before children are exposed or poisoned. Chapter 6 explains why Kent County should move toward universal BLL testing.

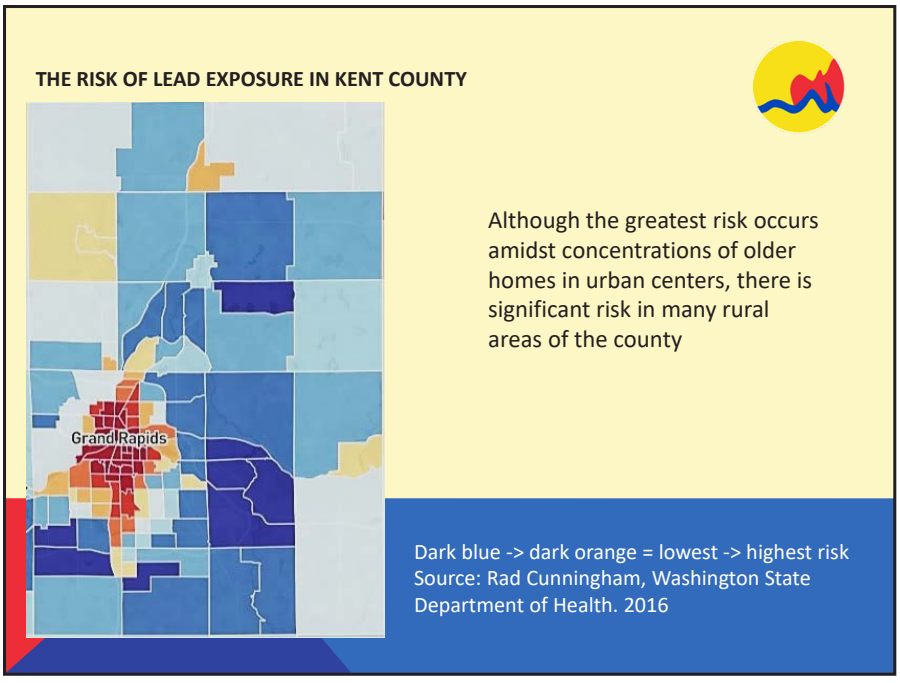
Chapter 4: CURRENT MODEL: GET LEAD OUT OF POISONED CHILDREN'S HOMES

This chapter focuses on finding, fixing, and funding lead-based paint hazards in older homes—because they cause more than 90% of childhood lead poisoning cases in Kent County.[1] In the current model, people typically don't look for lead hazards until after a child has already been exposed and poisoned. Chapter 5 suggests testing housing first, before children get exposed or poisoned. That chapter also addresses replacing lead service lines that deliver water into homes.

LEVELS OF LEAD HAZARD CONTROL

When Kent County Health Department (KCHD) receives results of children confirmed as lead poisoned, KCHD nurse case managers contact parents. They work to identify lead exposures that caused ≥5 BLL. They teach parents how to find obvious hazards, such as chipped and peeling paint in older homes or paint chips in bare soil outdoors. KCHD also refers families to programs that can inspect, assess, and fix lead hazards without creating more lead exposure.

The Kent County Lead Task Force learned about lead assessments and controls from Catherine Phelps, AAA Lead Inspections president, and Doug Stek, City of Grand Rapids housing rehabilitation supervisor.



Lead inspection and risk assessment

Each year Healthy Homes Coalition of West Michigan does about 50 free visual inspections to point out damaged surfaces and soil. They teach parents how to swipe samples to measure lead paint dust on floors, window sills and troughs, and porches. Qualifying families must live in a pre-1978 home within the Grand Rapids metro area; have a child under 6 in the home at least 20 hours a week; and have a low to moderate income.[2]

Kent County residents may get a free lead inspection and risk assessment along with lead hazard remediation or abatement activities. Qualifying families must live in a pre-1978 home; have a child under 6 or pregnant female living in the home; and have a low to moderate income. The City of Grand Rapids Housing Rehabilitation Office offers this service within Grand Rapids city limits. Out-county households can receive this service through the MDHHS Lead Safe Home Program.[3]

For confirmed ≥20 BLL, KCHD contracts for a lead inspection and risk assessment and requires that the property owner do interim controls (described below) within 30 days.

“If paint is intact, it’s not a hazard. We focus on areas with deteriorating paint and paint dust, especially windows, doors, porches, stairwells, kitchens, and bathrooms,” Catherine Phelps said. She and her crew use dust wipes, soil samples, and an expensive X-ray fluorescence spectrometer device to find lead-based paint. They examine surface by surface, often taking 200 samples in a home. The process takes one person about four hours. Two people working together can complete the inspection and assessment in two hours for about $750.

Only state-certified people working for state-certified organizations may do paint inspections and risk assessments. They must take a five-day course, score at least 75% on the exam, and take a refresher course and test every three years. These professionals also need construction experience or a related degree. The City of Grand Rapids contracts with three companies for paint inspection and risk assessment services. AAA Lead Inspections is the only one in Kent County . The others are in Plainwell and Romulus.

Lead Renovation, Repair and Painting Rule

In 2010, the EPA’s Lead Renovation, Repair and Painting Rule (RRP) went into full effect. It requires lead-safe work practices when disturbing paint in pre-1978 homes. RRP applies to renovation contractors, plumbers, electricians, rent-collecting landlords, and anyone else working for profit.[4]

These professionals must take classes and pass an exam to be certified as lead-safe renovators. In Kent County, the Rental Property Owners Association (RPOA) offers these classes. Whenever their work will disturb paint in a pre-1978 home, people remodeling or repairing for profit are supposed to do three things. They must test for presence of lead-based paint, use lead-safe work practices, and do a visual clearance when they finish renovating.

Doug Stek said that using lead-safe practices requires buying more plastic to contain the paint dust. It costs about 5% more to install windows and doors using lead-safe practices.

Now for the caveats. Michigan’ s Child Lead Poisoning Elimination Board (CLPEB) reported, “Compliance with federal RRP falls short of the intended goals, as the program is administrated and enforced from EPA Region 5 in Chicago. This remote administration, combined with a lack of consistent RRP follow-through in Michigan’s codes and in Michigan’s licensing and permitting processes, has caused a sharp decrease in new RRP certifications and renewals among Michigan contractors.”[5]

Homeowners should follow RRP for safety purposes, but they’re not legally required to do so. Many don’t even know about it. So they’re likely to do dry scraping or machine sanding when they prepare surfaces for painting. They don’t contain the dust, properly clean and dispose of lead paint debris, or check that all lead paint hazards have been cleared. And homeowners often do DIY work when pregnant women and young children are most vulnerable, like in the weeks before or after a birth.

Abatement

The federal Housing and Urban Development (HUD) and MDHHS define lead abatement as work designed to permanently eliminate lead-based paint or lead hazards.[6] This includes

- removing lead paint hazards by enclosing them with a barrier, such as vinyl siding or flooring
- encapsulating surfaces with a special thick paint-like coating
- replacing lead-painted windows, doors, trim, and stair rails
- removing lead-contaminated soil and covering the area with concrete

Only people certified by MDHSS as lead abatement supervisors and workers may do this work in Kent County.[7] They may only use lead-safe work practices approved in the 2012 HUD Guidelines[8] or by U.S. Environmental Protection Agency (EPA). For example, they're not allowed to use power sanders without HEPA vacuum systems. Nor may they burn off paint with torches or use heat guns that heat over 1,100 °F.

Lead abatement supervisors must file an occupant protection plan for each dwelling. The basic principles of protection are to contain, clean, and clear. Lightly spraying surfaces with water before sanding, scraping, or cutting a paint surface helps contain dust. Lead-safe cleaning uses HEPA-filtered vacuums and three-bucket washing, so dirty mops don't get rinsed in clean water. These state-certified lead workers bag, seal, and take away the paint and dust—and they never reuse plastic. Risk assessors judge the hazard as cleared only after doing visual assessments and taking dust wipe samples that get tested at accredited labs.

"Occupant protection is first and foremost. In fact, a leading cause of lead poisoning is unsafe remodeling, often by do-it-yourselfers (DIY). The last thing we need is to poison a child in the process of making the home lead safe," Stek told the lead task force.

He and several colleagues are state-certified lead abatement supervisors and certified renovators. They generally don't use encapsulation for abatement, because it takes so much time to prepare surfaces to ensure adhesion lasts for at least 20 years. Enclosure or replacement is usually cheaper. Stek said the average cost to remediate lead paint hazards in Kent County housing is $10,473 per unit. That's for making it lead safe. Totally abating lead hazards permanently can cost $40,000 for a 1,200-square-foot unit.

Remediation, also known as interim control

Remediation covers a range of actions that don't count as lead abatement, from homeowner DIY renovation to contractor rehabilitation and remodeling. These actions aim to temporarily make dwellings lead safe, such as specialized cleaning, repairing damaged paint, and covering contaminated soil with of grass or six inches of mulch. Remediation also includes projects not covered by some lead hazard control programs, such as correcting plumbing or water service line issues.

"While abatement is often the preferred solution, financial considerations, both before and after remediation, dictate the use of interim controls to address most identified hazards. Some interim controls can be nearly permanent. Paint stabilization is much cheaper and safer than tearing out and replacing surfaces. The property owner can safely maintain the surfaces afterwards using RRP (certified renovator) staff. Abatement procedures that leave the paint in place must be maintained by state-certified abatement professionals.

"This brings up another important distinction: when these projects are completed and pass clearance, they are lead safe, not lead free. And they are only lead safe the day the clearance tech took samples. There is no guarantee they are still lead safe the next morning, particularly if the residents have moved back in," Stek said. Re-exposure can happen if someone bangs up a painted surface or digs through grass or mulch to contaminated soil below.

The RPOA and other experts recommend that owners and renters do two things after painting over lead hazards. First, they should check every six months for chipped or peeling paint or bare soil, and renters should report trouble spots to landlords. Second, occupants should regularly do lead-safe cleaning.[9]

WHO FINANCES LEAD HAZARD CONTROL

Most lead hazard control work in Kent County is financed through federal HUD funds. These come through two channels, either HUD 's lead hazard programs or its Community Development Block Grant (CDBG) programs.

Grand Rapids, Wyoming, and the rest of Kent County

The City of Grand Rapids Lead Hazard Control Program (LHCP) is known as Get the Lead Out ![10] It's been successful in getting funds from three HUD programs—Lead Based Paint Hazard Control, Lead Hazard Reduction Demonstration, and Healthy Homes Supplemental Funds. The Grand Rapids LHCP has been awarded so many grants because it works with many partners—even more organizations than listed:

- LINC Community Revitalization trains lead abatement contractors and helps them win contracts.
- Rental Property Owners Association offers certified renovator training for landlords and contractors.
- Home Repair Services of Kent County trains landlords, homeowners, and contractors in lead-safe work and cleaning practices.
- Healthy Homes Coalition of West Michigan (HHC) reaches and educates low-income families and helps them apply for lead hazard control programs and provides training.
- KCHD tests BLL and manages ≥5 BLL cases. Its education and outreach spur health providers, owners, tenants, landlords, and others to focus on young children and pregnant women at risk for lead exposure.

Low-income homeowners in the City of Wyoming can apply for low-interest loans to repair and replace lead hazards. Wyoming offers these through its CDBG funds.[11]

Kent County's Housing Rehabilitation Program uses CDBG funds to offer deferred payment loans and grants to owner occupants with low to moderate incomes.[12]

Each program and government unit has slightly different requirements. Many focus on abating and repairing lead hazards in housing units owned by or rented to low- or moderate-income families. Most must include a child under 6 who is at risk for or already poisoned by lead exposure. Vacant family-friendly units may be eligible.

Assistance for Homeowners
•Homeowners are eligible for a no interest loan of up to $20,000. Payments will be deferred for up to five years, at which time, if the household continues to live in the assisted home, the entire loan may be forgiven.
•Other hazards in the home identified by the Healthy Home Rating Tool may be addressed at little or no cost to the Homeowner.
•To apply for assistance, download an application here (PDF), and the EPA Booklet: Protect Your Family from Lead in Your Home (en Espanol) or call the Housing Rehabilitation Office at (616) 456-3030 to have one mailed to you.

Assistance for Landlords
•Rental property owners may be eligible for deferred loans of up to $20,000 for 1 - 4 unit properties, with a co-pay of 10% of the contract cost (minimum co-pay is $300).[13]

Michigan's Child Health Insurance Program (CHIP) recently expanded its covered services to include lead abatement in housing units occupied by Medicaid-enrolled children. The City of Grand Rapids will be able to abate 30 units with this funding.

Kent County Community Development and Housing Commission oversees applications, inspections, risk assessments, and abatement contracts outside the cities of Grand Rapids and Wyoming.

Who misses out

Older homes in Kent County remain lead hazards for many reasons.

Sheer number of homes. Between 2004 and 2015, the Grand Rapids program made 1,319 housing units lead safe. Its current HUD three-year grant proposes to abate lead in 150 more units by 2019. But Doug Stek said that Grand Rapids has 64,000 pre-1978 housing units—and 30,000 of them are at risk of having lead paint hazards. Outside Grand Rapids, Kent County has 78,000 pre-1978 units, of which 53,000 are at risk.[14] These 83,000 at-risk units account for a third of all Kent County housing units.

Limited public funds. The cost to inspect, assess, and abate or repair every Kent County home with lead hazards far outweighs the funds available.

Not enough contractors. Even if more money was available, there aren't enough lead-certified people available to do the work locally. The Grand Rapids LHCP alone had trained 92 lead abatement professionals by the end of 2015. But that's when housing prices began rising. With so much work available in renovation and new construction, the available lead contractor pool shrank by 75%. "They can make more money faster, and without having a lead supervisor looking over their shoulder," Stek explained. Connie Bohatch, City of Grand Rapids community services director, said that continuing to receive federal funds for lead hazard control depends on spending the funds they already receive. This shortage could be a job opportunity for people who aren't working now.

Eligibility requirements. "Our biggest problem is that, by state law, we can't contract with someone who owes city back taxes or fees," Stek said. That's a big hurdle for low-income homeowners or landlords who might be eligible. Another problem is that most HUD lead hazard control funds are for at-risk families and young children. Families who earn more than 80% of area median income are often on their own to pay for fixing lead hazards. Owners can check MDHHS online registries to find people with current certificates to do lead abatement.[15] They will face the same availability problem that the Grand Rapids LHCP already faces. The CLPEB *Roadmap* report lamented that there are few incentives or penalties to encourage private property owners to look for or address existing lead hazards. This is especially true in Kent County, where many potential homebuyers regularly offer well above the asking price.

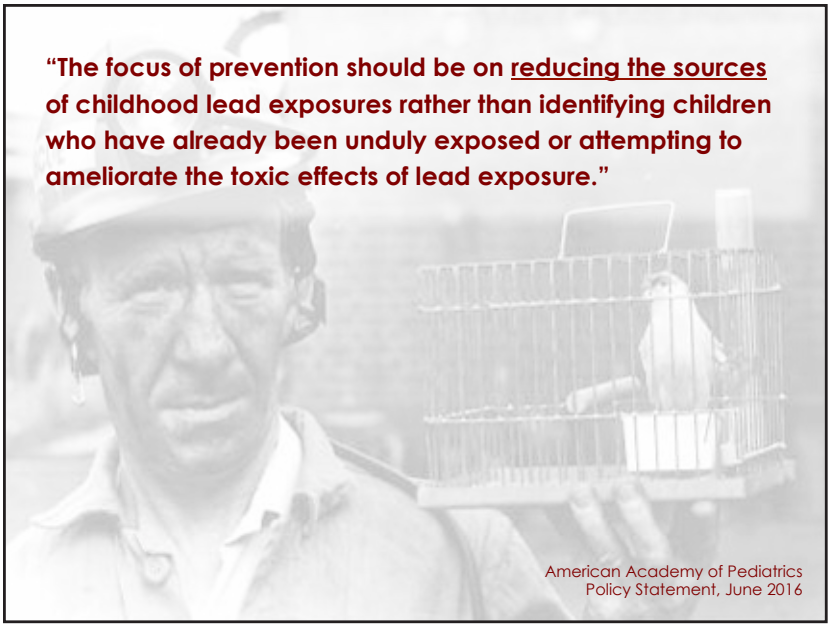
Fear. Stek said that some people do not want to accept a LHCP loan because they're afraid of not being able to make payments and having a lien put on their property. Immigrants without documents are afraid to push landlords to repair lead hazards or to show ID to officials who administer public funds.

Stek said that Grand Rapids has a great local track record for accessing lead hazard control funds. Yet, Kent County child lead poisonings have been rising since 2014. That's why it is time to switch paradigms, which the new Michigan Child Lead Exposure Elimination Commission also advises. It would be better to cure the home before any child must be treated. This requires assessing high-risk homes, disclosing known properties with lead hazards, and addressing obstacles to paying for assessment and abatement. The next chapter addresses this situation.

As the CLEPB reported, "Elimination of child lead exposure in Michigan will not occur unless all lead hazards are eliminated to the greatest extent possible. The vast majority of environmental lead investigations are triggered by a child's EBL. This reactive strategy, an action of secondary prevention, does not allow for the elimination of child lead exposure, because it requires, by its very nature, that children be exposed prior to an investigation."[16]

Chapter 5: A BETTER MODEL: TEST ENVIRONMENTS FIRST

Rather than waiting to find and get rid of lead exposure after a child is poisoned, we should test housing and environments first—before children get exposed and poisoned. National, state, and local experts share the conclusion that lead poisoning is 100% preventable.



Eliminating child lead exposure requires "a new paradigm focused on primary prevention and health equity." That comes from a November 2016 report, A *Roadmap* to Eliminating Child Lead Exposure. Michigan Lieutenant Governor Brian Calley chaired the board that produced the report. It says that lead exposure disproportionately impacts low-income areas and minority children by affecting their cognition, behavior, and future earnings.[1]

In 2015, Kent County had 7.6% of all Michigan children under age 6. But we had 12.7% of Michigan's lead-poisoned children.[2] If we, as a community, grasp that each child's lead poisoning affects all of us in Kent County, then we'll be more motivated to work toward primary prevention. "Child lead exposure also results in significant societal and budgetary costs, including increased crime and increased need for services. All of these impacts must be considered when weighing the costs and benefits of programs and initiatives aimed at eliminating exposure," *Roadmap* says.[3]

As a county, we need to identify and eliminate lead exposure, leverage effective policies, and invest in what promises the greatest return.

IDENTIFY AND ELIMINATE LEAD EXPOSURE

After consulting with subject matter experts, along with intense discussion, the Kent County Lead Task Force decided that making all homes lead safe should start with a comprehensive public education campaign. (Chapter 7 lists all lead task force recommendations.) This campaign will focus public awareness on what everyone needs to know—and who especially needs to know about lead exposure during critical life stages or events. Chapter 6 deals with the campaign's health awareness objectives.

The information below summarizes why environments need to be assessed.

What everyone needs to know about local lead sources

Lead poisoning is as preventable as polio

Polio used to paralyze an average of 15,000 Americans each year. In 1952 alone, more than 21,000 Americans developed paralytic polio. Dr. Jonas Salk developed a polio vaccine at University of Michigan in 1955. After people started getting vaccinated, polio cases plummeted. Since 1979, no cases of polio have originated in the United States.[4]

It is common knowledge that everyone needs childhood vaccinations to protect them from hepatitis, flu, mumps, measles, and more. It must become common knowledge that children also need homes free of lead exposure to protect them from lead poisoning. In Kent County, about 90% of all childhood lead poisoning cases result from deteriorating lead-based paint and lead dust in older homes and bare soil around them.[5] Lead dust results from paint and the legacy of leaded gasoline. Lead in vehicle exhaust settled into soil, where it remains a risk until removed or covered with grass, mulch, or cement. Covering lead-contaminated soil with at least six inches of bark, sod, gravel, or artificial turf is an interim control. Removing and replacing soil at a six-inch depth, or covering it with concrete, counts as permanent abatement.

The Rental Property Owners Association, based in Grand Rapids, advises members to treat any property built before 1978 “as if” it has lead hazards. This means checking every six months for bare soil near the dwelling or garage. It requires checking for and repairing peeling paint on windows and interior and exterior surfaces.[6]

Removing lead hazards from housing is one of three best ways to prevent childhood lead poisoning, according to the national Health Impact Project. Its team of 40 experts included Dr. Mona Hanna-Attisha, who uncovered the Flint water crisis. Their recent report, *10 Policies to Prevent and Respond to Childhood Lead Exposure,* explains why protecting children against lead exposure will enhance their opportunities to succeed and reduce costs to taxpayers.[7]

Everyone should know that lead poisoning is completely preventable and know which local lead sources pose the most risk. This common knowledge must reach the whole community—including families, owners, renters, buyers, building permit officials, hardware stores, rental property owners and realty agents, medical providers, churches, refugee resettlement agencies, and other community-based organizations.

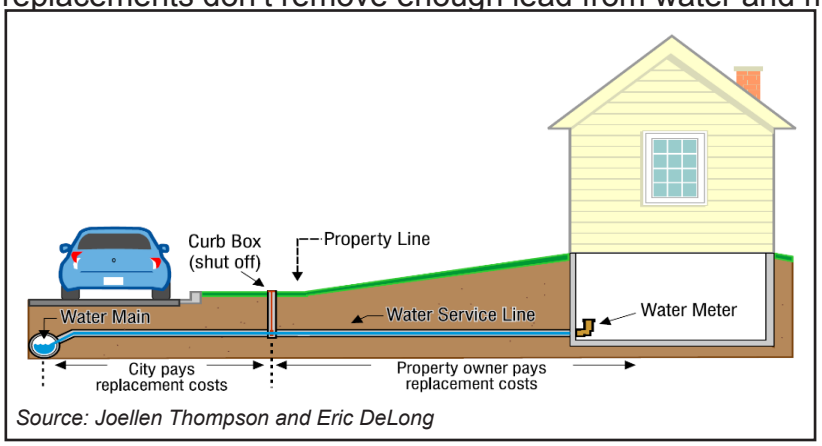
Critical times to know and share lead exposure information

Lead exposure is particularly risky for pregnant women and young children. When more people know about lead hazards in older homes, then expectant parents and parents of young children will be more alert to risks. Their friends, relatives, neighbors, co-workers, and health providers will more likely raise the topic.

Pregnant women and young children are most likely to breathe, ingest, or absorb lead dust when they spend time in older poorly-maintained homes—or homes undergoing renovation. People often remodel before or soon after a birth. *10 Policies* cites several studies that link interior renovation to higher blood lead levels. One showed that 2-year-olds whose homes had been remodeled inside had 12% higher BLL than 2-year-olds whose homes hadn't been renovated. Higher lead paint content produced higher BLL. A review of case records in upstate New York showed that 14% of children with ≥20 BLL lived in homes that had been recently remodeled. Of this group, two-thirds had been renovated by residents.[8] Hardware and home supply stores could help prevent lead poisoning by routinely supplying information on lead-safe work practices.

Anytime someone buys, sells, leases, or rents a pre-1978 property, the lead hazard conversation must happen, under the federal law known as Title X. Parents need to be aware of lead hazards when they put their children in daycare, whether in a licensed facility or a relative's home.

Another top three strategy from *10 Policies* is to fully replace lead service lines (LSL), from street to structure, in homes built before 1986. In 1986, the Safe Water Drinking Act prohibited installing or repairing any lead pipe, solder, plumbing fitting, or fixture. In public water systems, LSL have two parts. The system-owned section runs from the water main to the curb box shut-off at each property line. The property owner is responsible for the part between the curb box and water meter. In a partial LSL replacement, a utility replaces only its portion. Studies in the U.S. and Canada have found that partial LSL replacements don't remove enough lead from water and may in fact raise the risk of lead in water.[9]



Source: Joellen Thompson and Eric DeLong

Eric DeLong explained LSL replacement to the lead task force. Thompson was the City of Grand Rapids Water System manager, and DeLong is the Grand Rapids deputy city manager.

Grand Rapids has about 18,000 lead service lines spread among its three wards. Since 1992, Grand Rapids has replaced its LSL portion whenever they leak, break, or are exposed by construction projects. They've also done so whenever property owners replaced their portion of the service lines.

Thompson explained that when you open the pipe and replace just the city portion—or if there's earthshaking construction, like during road repair—then little lead particles can shake loose and stay stuck in faucet aerators. That's why Grand Rapids used to suggest that property owners replace their LSL part. However, owners had the option to decline. The City offers low-interest loans spread over 10 years so owners can replace their LSL portions without a break or reconstruction. In 2017 the City began doing full LSL replacement whenever they do major road reconstruction. They roll the cost into water rates for all Grand Rapids

customers. The rate increase doesn't affect customers outside Grand Rapids.

LEVERAGE EFFECTIVE POLICIES

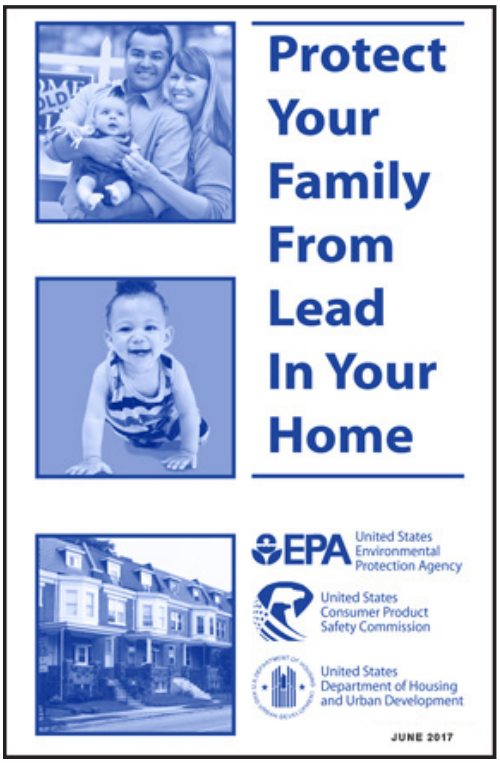
Good laws, regulations, and ordinances related to lead exposure exist throughout our nation. But they are too fragmented to make sure we test housing and environments—before children get exposed or poisoned.

Among other recommendations, the lead task force suggests finding ways to enforce the EPA's Lead Renovation, Repair and Painting Rule (RRP) and to strengthen lead hazard disclosures.

Enforce RRP

As *Roadmap* explains, the EPA rarely enforces RRP in Michigan.[10] Kent County needs to find other ways to reach contractors and rental property owners who work on their own properties. They need to learn and use the lead-safe work practices RRP calls for when disturbing paint in pre-1978 homes. RRP applies to renovation contractors, plumbers, electricians, rent-collecting landlords, and anyone else working for profit.

According to *10 Policies,* every dollar spent on RRP enforcement would yield $3.10 in future benefits. The report says the EPA and states should zero in on RRP enforcement in child care facilities and pre-1960 housing. Consider this national example for just one year. Ensuring that contractors comply with RRP "would protect about 211,000 children born in 2018 and provide future benefits of $4.5 billion, or about $3.10 per dollar spent. This includes $990 million in federal and $500 million in state and local health and education savings and increased revenue. The effort would cost about $1.4 billion."[11]



To put it into perspective, investing $6,635 per child would return $21,327 per child in decreased public spending and increased lifetime earnings. Those 211,000 children protected from lead amount to more than the entire population of Grand Rapids.

Strengthen disclosure

The EPA's Residential Lead-Based Paint Hazard Reduction Act of 1992 requires that before signing a housing contract to sell or lease property, sellers and landlords must give buyers and renters the pamphlet *Protect Your Family from Lead in Your Home.* Owners must disclose known lead-based paint and lead-based paint hazards and provide available reports to buyers and renters.[12] Note the words *known* and *available.* Home buyers have 10 days to conduct a lead-based paint inspection and risk assessment (LIRA) at their own expense. A LIRA costs about $750 in Kent County.

Kent County Housing Regulations, 1995: Article 606 states: “It shall be the responsibility of the owner of any dwelling or dwelling unit to correct or eliminate existing or potential lead poisoning hazards as directed by the Health Officer.” Enforcement kicks in for confirmed ≥20 BLL. That’s when Kent County Health Department contracts a lead risk assessment and requires the property owner to conduct interim controls (prep and paint, cover or replace soil) within 30 days. Note that the enforcement level for that ordinance is ≥20 BLL. The Centers for Disease Control and Prevention (CDC) said in 2012 that case management for children under 6 should begin at ≥5 BLL. HUD policy states that units supported by tenant-based assistance with children having BLL of 5 and above should receive EBL investigations and be remediated.

Kent County could strengthen disclosure by enforcing the landlord penalties provided for in the Michigan Lead Abatement Act. These apply to lead-based hazards in rental units.[13]

The lead task force noted in several meetings that there’s no incentive for property owners to discover lead hazards and produce reports before selling or renting the property. There’s currently no way to monitor whether owners are disclosing known lead hazards or even handing out the EPA pamphlet. It’s likely that owners who rent privately, say to family members, do not even know about the EPA law or Kent County regulations.

After *Roadmap* was published in November 2016, Governor Rick Snyder acted quickly on the report’s advice to establish a permanent Child Lead Exposure Elimination Commission (CLEEC). Paul Haan serves on CLEEC and the lead task force. He’s also executive director of Healthy Homes Coalition of West Michigan. Haan told the lead task force that CLEEC aspires to develop or strengthen regulations and laws such as requiring a LIRA before selling, transferring, or leasing a pre-1978 home. It also wants to be more proactive about rental certification in high-risk housing. Doing so will require more public investment in lead-safe housing.

The lead task force had several discussions about conflicting interests as to who would be affected by strengthening disclosures. For example, these requirements could raise costs that landlords might choose to pass on to renters, which might displace those who can least afford it. That’s why the lead task force recommends that the Kent County Board of Commissioners should charge the Kent County Community Health Advisory Committee (CHAC) to work with stakeholders to develop plans by June 30, 2018, for how the community can work toward fulfilling this report’s recommendations.

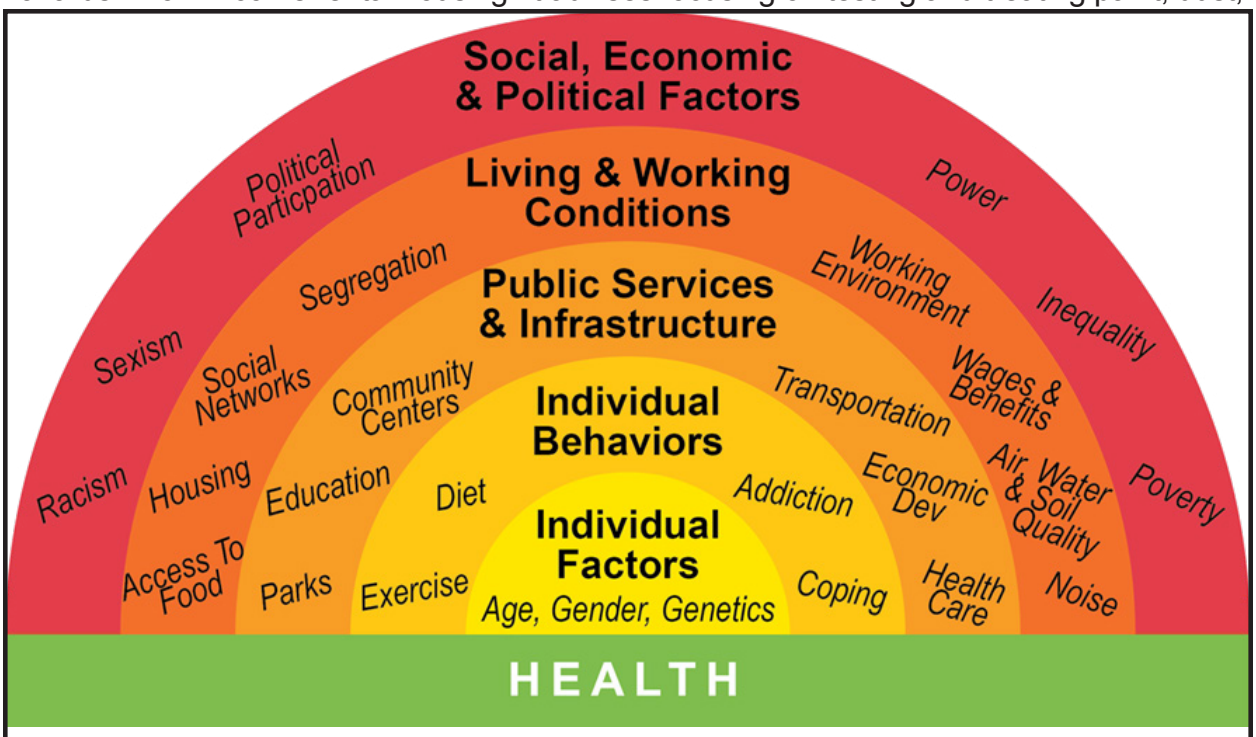
INVEST IN WHAT PROMISES THE GREATEST RETURN

Given available funds and what we know, where is the greatest return on investment (ROI) so that everyone has a universal chance for lead-safe housing? Recommendations by the lead task force, CLEEC, and *10 Policies* overlap in several ways.

Prioritize areas with the greatest need

The lead task force asks CHAC to encourage State of Michigan officials to implement *Roadmap* recommendations to eliminate all lead exposure. Like Kent County Health Department (KCHD), *Roadmap* urges that "health equity must underlie all policy and funding recommendations."[14] This means that areas of high risk and high need deserve priority.

10 Policies found that the best ROI comes from removing lead paint hazards from low-income housing built before 1960 and other places children spend time, such as schools and child care facilities. It notes that government units need neighborhood-level data to know whether it's most important to target either or both low-income rental housing and low-income, owner-occupied houses handed down through generations. When the latter are transferred, rather than sold, there is no trigger for lead hazard assessment or disclosure. The ROI choice depends on how strongly local policies already prevent lead hazards in low-income rental housing. It advises focusing on testing and treating paint, dust,



Health equity, diversity, and inclusion are guiding KCHD. Source: KCHD

and soil and replacing old windows—as well as replacing LSL that carry drinking water.[15]

Coordinate and leverage funds to assess, remediate, and abate lead hazards

Reports at all levels agree that federal, state, and local governments need to invest more in assessing, remediating, and abating lead hazards. The lead task force recommends starting by identifying creative ways to mix and match existing opportunities. For example, lead hazard control programs may not use HUD funding to replace LSL. However, a recent expansion of what Michigan Medicaid allows through CHIP (Children's Health Insurance Program) makes LSL replacement possible for

people of certain ages and incomes.

The lead task force recommends finding ways to include lead hazard abatement while replacing windows in blight reduction or energy efficiency programs.

Train and certify more people

Both *Roadmap* and the lead task force emphasized that Michigan and Kent County don't have enough certified people to do lead inspection, lead abatement, and lead safe renovation. Public and private sectors could invest in training low-income people from high-risk neighborhoods to find and fix lead hazards.

10 Policies said that training and enforcing RRP is simple and has a high cost-benefit ratio. That's because the training is widely available and because "state and local governments have the opportunity to codify EPA's requirements or adopt their own laws and to conduct aggressive public outreach about lead safe renovation practices."[16]

Improve data sharing

Reports at all levels agree that federal, state, and local governments need to invest more in sharing data among agencies and with the public. The lead task force and subject matter experts bemoaned that health information privacy regulations prevent government units from regulating properties where children of multiple families have been lead poisoned. Kent County could make better lead policies and interventions if it invested in geographic information systems (GIS) related to housing, health, and other lead-related factors.

Ideally, members of the public should be able to enter and access environmental data about lead levels in soil, water, and specific properties. Michigan has a Lead Safe Housing Registry that hasn't been updated in years. Given that repainting is an interim control, not permanent abatement, many places listed as lead safe in the registry are no longer so. Each property record has data fields for who inspected the property when; whether it had lead hazards; who did abatement, interim control, or a mix and when; and which inspector cleared the property as lead safe on which date. In reality, many data fields simply say UNKNOWN.[17]

Grand Rapids has a Lead Safe Registry for rental units and private residences—but hasn't updated it since April 6, 2017. Many listed properties last had a lead clearance inspection in 2004 or 2005.[18]

Gathering and analyzing good data is essential if Kent County wants to get the best, most equitable return on investment. This applies both to eliminating lead exposure and adopting universal BLL testing in children under 6, which Chapter 6 deals with.

Chapter 6: A BETTER MODEL: TEST EVERY CHILD

Preventing childhood lead poisoning depends on finding and fixing lead hazards. National, state, and local experts also recommend testing blood lead levels (BLL) in every child under age 6.

Universal testing helps measure how well we're doing at eliminating lead exposure. It identifies poisoned children who need treatment and geographic areas that most need lead hazard control. Finally, universal testing provides data on long-term effects of low level lead exposure and best practices for treating lead poisoning.

TEST EVERY CHILD

Michigan Lieutenant Governor Brian Calley reminded the Kent County Lead Task Force that universal childhood BLL testing isn't a new idea. In 1991, for example, the Centers for Disease Control and Prevention still recommended testing all 1-year-olds—except in communities where large numbers or percentages of children had been tested and found not to have lead poisoning.[1]

Federal rules about lead in gasoline, paint, water supply lines, and renovation practices sharply reduced BLL. But before our nation had eliminated lead poisoning in all children, federal and state budgets slashed funding for lead testing and prevention. This short-term choice cut public spending to test for and treat lead poisoning and control lead hazards. Long term, it resulted in more public spending for special education and juvenile and adult incarceration. Society as a whole missed out on what those lead-poisoned children could have earned and contributed as healthy adults.

In 2004, an earlier commission laid out how to end childhood lead poisoning in Michigan by 2010. It recommended implementing universal testing statewide for three years (or doing universal testing in a pilot area).[2]

Calley chaired the team that produced the 2016 *Roadmap to End Childhood Lead Poisoning.* It recommends universal BLL testing between 9 and 12 months and again at 24 to 36 months.[3]

The lead task force recommends encouraging medical providers to test all children at the ages *Roadmap* suggests. Medical providers should collect venous blood samples within a month of discovering elevated BLL through capillary blood tests. Kent County will also need new strategies to reach families who don't get their children tested now. This includes those who are too transient to use primary care, don't speak English, or fear being exposed as undocumented. It also applies to families who think of lead poisoning as a problem only in poor neighborhoods or communities of color.

IDENTIFY HIGH-RISK POPULATIONS AND AREAS

Calley explained that when pediatricians and healthcare professionals view BLL testing as normal and routine, then we'll have more data to predict which populations,

neighborhoods, census blocks, or properties need more resources. In 2015, almost 30% of Kent County's Medicaid-enrolled children under 6 were not tested.[4]

"We also need to work with health professionals to get more testing of non-Medicaid children. If they don't get tested, then it's harder for us to find out which residences need lead control," Calley said.

Kent County has four times as many children without Medicaid compared to those who have it. In 2015, about 94% of Kent County's non-Medicaid kids under 6 were not tested.[5] But children don't have to live in a geographic high-risk area to be lead poisoned. As Chapter 2 described, they can be exposed to lead by older housing in suburban or rural areas, unsafe renovation, their parents' occupations and hobbies, or imported cosmetics, foods, folk remedies, pottery, or toys.

The lead task force recommends maintaining programs and practices now in place for treating lead-poisoned children and abating lead hazards that poisoned them. It calls for more state investment in zip codes with the most lead-poisoned children. "We should make sure that everything we do for secondary prevention eventually turns into primary prevention for someone else, such as children who later move into rental housing that's been remediated or abated," Calley said.

While working toward primary prevention, Kent County still needs to follow up with children who've already been poisoned. Interventions include nurse case management, home visits, nutrition counseling, lead-safe cleaning practices, transportation support for healthcare, and referrals to social services and organizations that can help families get and pay for better nutrition and lead abatement.

As recommended by *Roadmap,* Governor Rick Snyder established a permanent Child Lead Exposure Elimination Commission (CLEEC). This commission calls for comprehensive case management that offers one or two home visits by a trained educator for all children with ≥5 BLL. Children with ≥10 BLL should receive monthly nursing supports until BLL is brought below 5 (or lower, if the reference level changes).

It's important to intervene early with developmental and neuropsychological services. In 2017, a national Health Impact Project team of 40 experts produced *10 Policies* to Prevent and Respond to Childhood Lead Exposure. One of its key findings stated: "Providing targeted evidence-based academic and behavioral intervention to the roughly 1.8 million children with a history of lead exposure could increase their lifetime family incomes and likelihood of graduating from high school and college and decrease their potential for teen parenthood and criminal conviction."[6]

The lead task force recommends working with insurers. Two priorities are getting insurers to pay for BLL tests and provide expectant mothers' contact information, so Kent County Health Department can offer lead prevention messaging.

GATHER BETTER DATA

Among other healthcare objectives, the lead task force recommends gathering more and better demographic data for tested children. Making best use of this data depends on health providers reporting all test results to Michigan Department of Health and Human Services (MDHHS). “The collection of critical public health surveillance data from universal lead screening tests is essential for designing and carrying out effective primary prevention activities,” *Roadmap* says.[7]

Universal testing would let Kent County fill gaps in research about how lower BLL affects children. After all, the official position from WHO on down through national, state, and county levels, is that there is no safe level for lead in blood. The American Academy of Pediatrics policy statement says that even an amount below 5 BLL is “a causal risk factor for diminished intellectual and academic abilities, higher rates of neurobehavioral disorders such as hyperactivity and attention deficits, and lower birth weight in children.”[8]

10 Policies drew from the best available research to model future benefits for children with no lead exposure at all. Its model predicts that keeping BLL of children born in 2018 at zero would generate $84 billion in benefits. Children with zero BLL would require less public spending on health and education and collectively increase lifetime earnings by $77.2 billion compared to current BLL. Surprisingly, the model also found that the most benefits of exposure prevention accrue for children whose blood lead would otherwise be below 2 BLL. That’s a powerful reason to test housing first and confirm the success of lead hazard control by testing BLL in all children.[9]

However, gathering better data requires more investment in state and county information technology infrastructures. Roadmap explains that MDHHS lacks the federal and state funding to fully comply with current requirements to test BLL in every child under 6 enrolled in either Michigan Medicaid or Women, Infants, and Children (WIC) programs.[10]

CLEEC says the state should support development of a single, centralized data system. This system would capture all information necessary to find and fix lead hazards and implement universal BLL testing for children under 6. It would include data necessary to support case management and track results with intervention nonprofits such as Great Start Collaborative, Head Start, and community centers.

Calley and the lead task force explored avenues for Kent County to get privacy waivers, so they could access more data. They could use this data in pilot projects to test environments, test children, or coordinate with people who already visit homes, such as meter readers, window installers, or home healthcare providers.

The above ideas apply to data used by governments and nonprofits. The lead task force also recommends creating a public access data system, so residents could more easily get the information they need to keep their children safe. This includes details on rates and locations of lead testing and poisoning levels. Better public data would help people find abated homes to rent or buy, as well as childcare facilities with current records on lead inspection and abatement.

Chapter 7: RECOMMENDATIONS FOR KENT COUNTY

Lead poisoning is 100% preventable, though achieving blood lead levels (BLL) of zero in all Kent County children under age 6 may take a generation. The task is enormous, far too much for any one entity to solve on its own. Most lead poisoning in Kent County results from lead paint hazards, so preventing lead poisoning requires removing those risks. Kent County has 83,000 pre-1978 housing units at risk of having lead paint hazards, and 30,000 of these are in Grand Rapids. The average cost to remediate lead paint hazards in Kent County is $10,473 per unit. Totally abating lead hazards permanently can cost $40,000 per 1,200-square-foot unit.

Meanwhile, the Kent County Lead Task Force has a plan to begin the journey. It offers three overarching recommendations, followed by objectives for public education, policy, risk identification and elimination, and health care. The lead task force also offers advice specific to groups, such as parents, physicians, landlords, and others on how to prevent and respond to childhood lead poisoning.

The following recommendations were shared with the community at public meetings held on November 30 and December 1, 2017. These recommendations were also shared on the county website and social media. Community input through those forums was used to improve the recommendations.

KENT COUNTY LEAD TASK FORCE RECOMMENDATIONS

The lead task force concludes that actions should be taken to identify causes of lead poisoning, eliminate exposures, and create universal testing of children. It recommends that the Kent County Board of Commissioners immediately take three overarching actions:

- Charge the Kent County Community Health Advisory Committee (CHAC) to work with stakeholders to develop plans by September 30, 2018, for how the community can work toward fulfilling this report's recommendations.
- Charge CHAC to review elevated blood lead levels (EBL), monitor progress on this report's recommendations, and update the community at least once a year.
- Encourage State of Michigan officials to implement the recommendations of the Governor's Child Lead Poisoning Elimination Board in its November 2016 report, *A Roadmap to Eliminating Child Lead Exposure.*

1. Public Education Objectives

Deliver a comprehensive public education campaign which will:

A. Inform the community about how to reduce the risk of lead exposure.
B. Inform the community about how to mitigate exposure impacts through better nutrition and other best practices.
C. Educate about buyer/renter beware and to inform people about relief resources.
D. Provide information for building permit officials, hardware stores, etc.
E. Provide information to medical providers for distribution to clients.
F. Partner with the efforts of the NAACP, local churches, and other community based organizations to advance lead prevention campaign.
G. Encourage refugee resettlement agencies to educate on the need for testing

and hazard identification.
H. Create a speakers bureau for education community groups.
I. Inform rental property owners and realtors of their obligation to distribute the *Protect Your Family From Lead in Your Home* pamphlet and lead disclosures at the time of leasing or sale.
J. Educate teachers about lead and encourage them to share information about resources with families.
K. Work with Michigan State University Extension and others to provide training and information about landscaping and soils.

2. Policy Objectives

A. Expand data sharing agreements with Michigan Department of Health and Human Services (MDHHS).
B. Identify creative solutions for leveraging resources for preventing lead exposures in homes such as using existing Medicaid funding and reimbursements, leveraging HUD policy and resources, identifying new sources of funding, and other possibilities.
C. Coordinate resources with other housing rehabilitation and weatherization resources and private sector investments, supplementing with local resources to leverage external investments.
D. Maintain the current programs and practices offered by local agencies and organizations.
E. Encourage the State of Michigan to provide additional funding for outreach, education, assessment, and abatement to zip codes with the highest number of children with EBL.
F. Advocate for the Michigan Health Endowment Fund to support lead poisoning prevention initiatives in Kent County.
G. Ordinances regarding inspections for rental properties and lead in Kent County communities should be studied and summarized.
H. Identify model ordinances and polices for lead prevention and share with local units of government in Kent County.
I. Explore regulatory strategies for addressing homes that have had multiple cases of children with elevated blood lead levels.
J. Study whether rental property owners are providing required educational materials and disclosures to renters.
K. Use geographic information systems (GIS) to link data related to housing, epidemiology, and other important factors for informing better policy and interventions.

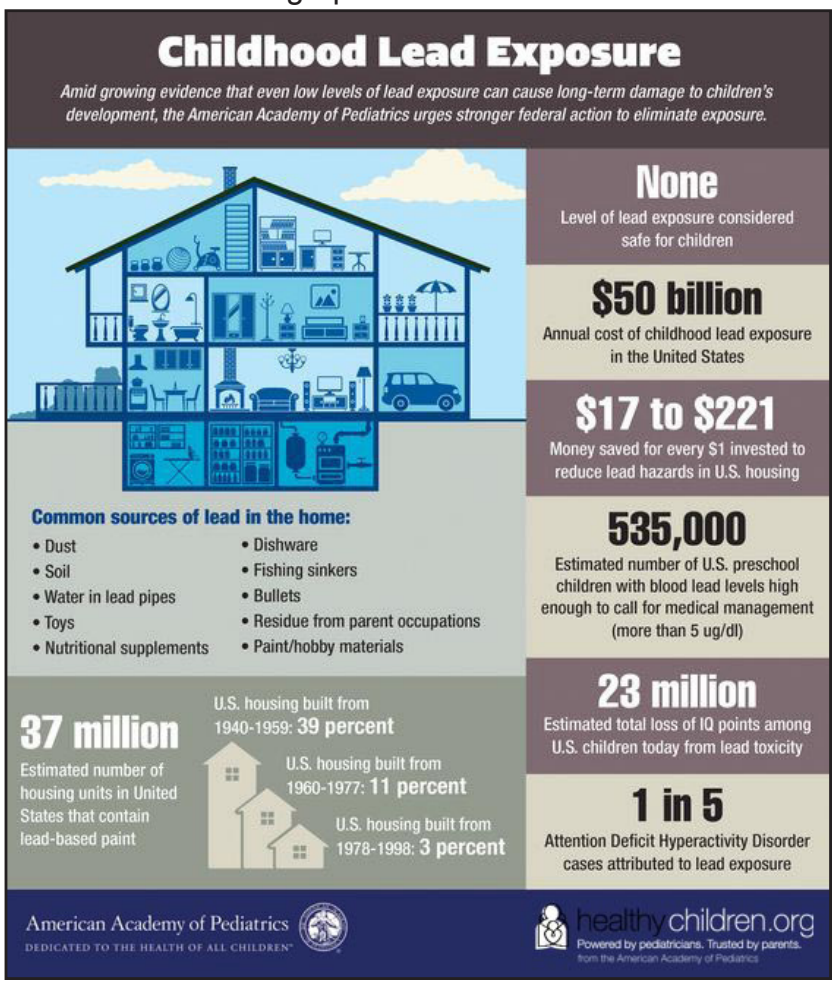
3. Risk Identification and Elimination Objectives

A. Explore all opportunities to make funds available for lead assessments and for home improvements designed to eliminate household lead exposure.
B. Offer periodic training about lead hazard identification for local government employees, public playground owners, child care providers, and residents.
C. Educate contractors and rental property owners, especially individuals new to those occupations, about the federally mandated certification program (Lead

Renovation, Repair, and Painting training).
D. Partner with rental property owners and realtors to identify strategies for preventing lead exposure while avoiding significant increases to housing prices.
E. Create a public access data system where residents can report assessments such as soil lead levels, water quality, childhood lead levels, and home lead assessment data.
F. Encourage municipal water suppliers to seek opportunities to identify high-risk plumbing features and to distribute educational materials.
G. Encourage the Kent County Lead Bank to continue to remediate residential properties to the same standards as the City of Grand Rapids Lead Control Hazard Program and to continue requiring to follow lead safe practices while remodeling and to get a lead clearance test before obtaining a use and occupancy permit.

4. Health Care Objectives

A. Encourage medical providers to test all children at 9 to 12 months and 24 to 36 months of age.
B. Encourage medical providers to collect venous blood samples within one month of discovering elevated results with capillary blood tests.
C. Improve/increase the collection of demographic data for children tested.
D. Health insurance companies should include lead screening in expectations for provider quality incentive programs to create aligned incentives for providers to engage in these critical screening programs.
E. Home healthcare providers should be trained to recognize lead risk factors and about the resources that are available in the community to address these situations. They should also be prepared to discuss lead poisoning



prevention with their clients.
F. Implement community-based strategies to increase testing via mobile clinics,events, etc.
G. Work with insurance companies to identify ways Kent County Health Department (KCHD) could receive contact information for distributing lead prevention messaging to expecting mothers.
H. Engage Kent County's vast maternal and infant health home visiting network with primary prevention through providing early education to expecting and new parents, linking those parents to resources to assess their homes for hazards and remediation as needed, and helping to identify particularly high-risk housing for intervention.

ADVICE SPECIFIC TO GROUPS

Expectant parents and parents with young children

If you are pregnant, ask your doctor whether your blood should be tested for lead. Make sure your doctor tests your child's blood for lead at 9 to 12 months and 24 to 36 months of age. In Kent County, most lead exposure is from lead in paint, dust, and soil in and around homes built before 1978. But you can also breathe, ingest, or absorb lead from other sources. These include lead particles shaken loose in old plumbing fixtures, adult hobbies and occupations, and imported items.

If your home was built before 1978, check for peeling or chipped paint indoors, outdoors, and in bare soil

around the house. Do the same for any pre-1978 place your child spends time in, such as a childcare center or relative's home. Minimize your exposure by painting over deteriorated paint (using lead-safe work practices) and covering bare soil with grass, mulch, or concrete. Remove your shoes before you enter to limit the amount of soil with lead dust tracked into your house.

If your water comes from a private well, get it tested each year. The KCHD Laboratory gives out water sample collection kits for free. In 2017, it charged $18 to test a water sample for lead. Kent County's two other state-certified labs for testing water for lead and copper are Prein&Newhof, a civil and environmental engineering firm, and Pace Analytical Services, a sampling and analytic testing firm.

Wet-mop the floors frequently using a double-bucket method with frequent water changes. Wipe window sills using paper towels and soapy water, disposing the paper towels after cleaning each surface. Use a HEPA (high efficiency particulate air) filter on your vacuum cleaner. Wash your child's hands, bottles, pacifiers, and toys often, especially once your child starts playing or crawling on the floor of a pre-1978 residence. Whether you do remodeling yourself or hire a contractor, insist on lead safe work practices.

LEAD TEST SCREENING QUESTIONNAIRE

1. Is the child enrolled in Medicaid or on WIC?
2. Does the child live with anyone who has an elevated blood lead level?
3. Does the pregnant woman or child live in or often visit a house built before 1950 that has peeling or chipping paint? This could include a daycare, preschool, or relative's home. Did they do so in the recent past?
4. Does the pregnant woman or child live in or often visit a house built before 1978 that has been remodeled within the last year? Did they do so in the recent past?
5. Does the pregnant woman or child have a relative or frequently-seen friend with lead poisoning?
6. Does the pregnant woman or child live with someone whose job or hobby involves lead?
7. Does the pregnant woman or child's caregiver use any home remedies that may contain lead?
8. Is the pregnant woman or child an international adoptee, refugee, migrant, immigrant, or foster child?

Remember that early childhood development is complex. You can reduce the impact of your child's response to lead exposure through love, nurture, and healthy outdoor play. Diets high in iron, calcium, and vitamin C reduce lead absorption.

For more information, download the free Healthy Homes Basics app from Google Play or iTunes. Get local help from http://www.healthyhomescoalition.org/lead.

Physicians

Share basic lead exposure and prevention information with patients, especially expectant parents and those with young children. Test pregnant women at risk for lead exposure. Test all children at 9 to 12 months and 24 to 36 months of age. Ask whether patients have changed addresses since their last visit. Maybe you need to ask again about lead exposures.

If you haven't already, consider buying a portable blood lead analyzer so you can do capillary BLL tests with either a finger stick or heel prick. If you don't have a machine, make sure your patients know how and where to get a blood test at KCHD or an offsite lab. Within one month of discovering EBL, make sure patients get a venous test to confirm if the first test was a capillary draw.

Submit all blood lead laboratory test results within five days after test completion to the MDHHS Childhood Lead Poisoning Prevention Program. For more information, including patient handouts and LeadCare labs that do venous testing, go to www. Michigan.gov/lead. Physicians should encourage environmental testing and remediation to clients occupying higher risk properties.

Anyone who buys, sells, rents, or leases housing

By law, all sellers, property owners, and lessors must do two things before signing a housing contract to sell, rent, or lease property. They must disclose any known lead-based paint and lead-based paint hazards—and provide any available reports. They must give buyers, renters, or lessees a *Protect Your Family From Lead in Your Home* pamphlet. By law, realtors must inform sellers or lessors of their disclosure obligations.

Home buyers have 10 days to conduct a lead-based paint inspection and risk assessment (LIRA) at their own expense. A LIRA costs about $750 in Kent County.

If you are buying a home, don't overlook this information. If there isn't any "known" or "available" information, ask when the dwelling was built or last remodeled. Ask why the property has not been inspected for lead. You can try looking up the address online in the Michigan Lead Safe Housing Registry or the Grand Rapids Lead Safe Registry. Neither can be assured to be up-to-date, though.

If you are a renter, be alert for lead-based paint hazards. Tell your landlord when something needs to be fixed. Follow lead-safe cleaning practices. While you're waiting for your landlord to repaint or deal with contaminated soil, you can cover deteriorated paint with duct tape or contact paper. Don't let your children play in bare soil next to an old house or garage.

For more information, including the *Protect Your Family* pamphlet and disclosure forms, go to https://tinyurl.com/leadwarn. Homeowners and landlords can find help to pay for lead remediation and abatement at http://gettheleadoutgr.org.

Sellers, lessors, and property owners who do their best to offer healthy homes might consider advertising what they've done to make a home lead safe or lead free. They can invite potential buyers, lessees, or renters to inspect the property according to the checklist at https://tinyurl.com/fresh-home.

Contractors, remodelers, and DIY types

The EPA's Lead Renovation, Repair and Painting Rule (RRP) requires contractors to use lead-safe work practices whenever they disturb paint in pre-1978 homes. The RRP applies to renovation contractors, plumbers, electricians, rent-collecting landlords, and anyone else working for profit. Even though it doesn't apply to homeowners doing their own work, every do-it-yourself (DIY) type should follow it anyway.

RRP is important because the actions required to repair lead hazards can cause more lead exposure—if done incorrectly. For example, it can be dangerous to do dry scraping or machine sanding when preparing surfaces for painting. It's dangerous if you neglect to contain the dust, properly clean and dispose of lead paint debris, and check that all lead paint hazards have been cleared. And it's even worse when you do those things where pregnant women or young children live.

That's why you should either hire a contractor certified in lead-safe renovation or follow RRP rules on your own.

Only certified professionals may do lead abatement work, which permanently fixes lead hazards. Kent County doesn't have enough people certified in lead-safe renovation or abatement. Maybe that's an opportunity for you to create a market niche. Follow RRP rules or find a certified renovator at https://tinyurl.com/rrp-epa. Find certified lead contractors and professionals in Michigan or take classes to get certified at https://tinyurl.com/leadsafepro.

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