

COVER STORY LEAD'S POISONOUS LEGACY

Nightmare of lead a reality for many families in Detroit



FULL OF HOPE: Jeanine Cureton, 26, and Reginald Cureton, 30, gather May 7 with their children, from left, Shekinah, 7 months; Maurice, 7; Reggie, 9; Moriah, 2, and Novee, 5, in their Detroit backyard. The Cureton family is familiar with the effects of lead. Jeanine Cureton and Reggie suffered from lead poisoning, and Maurice had high lead levels. But they're working to overcome it. "Our kids don't give up," Reginald Cureton said.

KIMBERLY D. MITCHELL/Detroit Free Press

LEARNING STRUGGLES:

Study shows kids with poisoning history often do poorly on tests

HOPE TO OVERCOME:

Stimulating environment may help curb devastating effects

By **TINA LAM**
and **KRISTI TANNER-WHITE**
FREE PRESS STAFF WRITERS

Reggie Cureton doesn't recall pulling bits of lead paint off the wall near his crib as a toddler and eating it. For a long time, his parents didn't notice.

He was a bright baby who sat up early, walked early and recognized letters and colors early. But between the ages of 1 and 2, a blood test showed he had 21 micrograms of lead per deciliter of blood — more than double the level of concern set by the U.S. Centers for Disease Control and Prevention.

Now 9, Reggie is great at building with Legos but struggling with reading, memory and paying attention.

Reggie's challenges are familiar to his mother, Jeanine, who has her own history of lead contamination — and to generations of families living in Detroit. Despite significant declines in Detroit, thousands of children continue to be diagnosed with lead poisoning each year, a by-product of older homes with lead-based paint, pervasive poverty and an often unhealthy diet.

'These numbers are scary'

Now, a landmark study by the city health department and Detroit Public Schools of lead data and test scores shows that the higher the lead level, the worse a student's scores on the Michigan Educational Assessment Program exam, or MEAP.

Overall, 58% of roughly 39,000 DPS students tested — 22,755 children — had a history of lead poisoning, according to the study.

Perhaps more startling: Of the 39,199 students tested as young children, only 23 had no lead in their bodies.

Exposure to lead linked to lower MEAP scores

Students with a higher lead level scored lower on MEAP tests, based on a study of 7,255 Detroit Public Schools students.

	AVERAGE LEAD LEVELS*
Math	
Advanced	6.7
Proficient	7.2
Partially proficient	7.7
Not proficient	8.2
Writing	
Advanced	(No students scored at advanced level)
Proficient	7.9
Partially proficient	7.3
Not proficient	8.4
Reading	
Advanced	6.4
Proficient	7.2
Partially proficient	7.7
Not proficient	8.6
Science	
Advanced	6.7
Proficient	7.5
Partially proficient	8.3
Not proficient	8.6

"These numbers are scary," said Lyke Thompson, a Wayne State University professor who has studied lead poisoning in Detroit for more than a decade.

The correlation between high lead levels and low test scores carries particular resonance in Detroit, where students have fared poorly on academic achievement tests.

DPS students ranked last in the nation in 2009 on the National Assessment of Education Progress math test for fourth- and eighth-graders. The city's MEAP scores are consistently among the lowest in the state.

"This is a crisis," said Carole Ann Beaman, disabilities coordinator for DPS. "There is a clear connection between lead poisoning and academic problems, which is relevant to understanding achievement gaps and why schools are failing."

Other factors — including poverty and parents' level of education — may play a role. But the impact of lead on test scores has lingered in the shadows. Until now.

DPS emergency financial manager Robert Bobb said lead exposure is one factor that leaves some kids poorly prepared for school.

"Schools can be partners by, among other things, emphasizing reading early, as we have done, ensuring healthy

ABOUT THE STUDY

Detroit school and health officials analyzed lead levels in children and their performance on MEAP tests in 2008. The review was limited to students who did poorly on the MEAP and had been tested for lead levels, a total of 7,255 students. Analysis showed that, on average, students with higher lead levels generally had lower MEAP scores than students with less lead. While the numbers show a link between lead levels and test scores, that does not mean lead is the sole explanation for low scores.

*Lead levels are measured in micrograms of lead per deciliter of blood.

Sources: Detroit Public Schools and the Detroit Department of Health & Wellness Promotion

MARTHA THIERRY, KRISTI TANNER-WHITE
and TINA LAM/Detroit Free Press

foods in the cafeteria and making certain that physical education is universal," Bobb said. "Sadly, these results are not a surprise," said Marie Lynn Miranda, a former Detroit and director of the Children's Environmental Health Initiative at Duke University.

Miranda led studies in North Carolina and Connecticut that linked lead exposure to lower reading scores. "People have gotten complacent about lead."

No level is safe

In 1991, the CDC set 10 micrograms as its level of concern for lead in children, but dozens of studies have shown brain damage at lower levels.

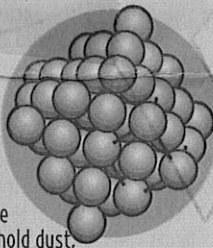
Many experts count kids with levels of 5 micrograms as lead-poisoned. The CDC said in 2005 that there is no safe level of lead for children. Although there are many ways children are exposed, most cases are from paint in homes.

Last year, more than 5,000 cases of lead poisoning were diagnosed in Detroit children younger than 6. More than 800 of those kids had lead levels of

How lead poisons

WHAT IS LEAD?

Lead is a neurotoxin that can reduce a child's intelligence and cause a lifetime of behavioral and health problems. Lead can be found in all kinds of places and is widespread in cities — such as Detroit — with older homes that have lead-based paint and where soil may be contaminated. Lead also turns up in household dust, water in lead pipes or faucets, toys, some pottery glazes and cheap dollar-store jewelry. The United States banned lead from paint in 1978 and gasoline in 1986.



HOW CONTAMINATION OCCURS

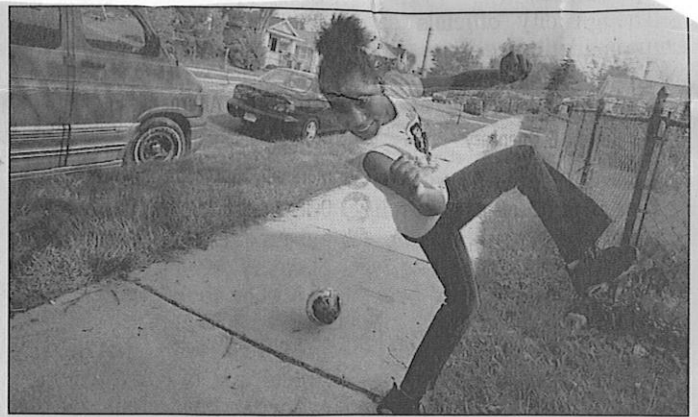
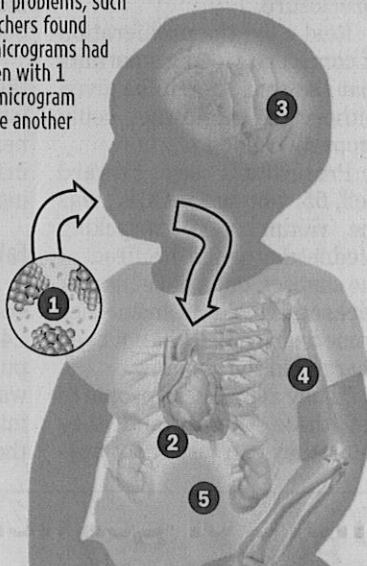
1 DANGER TO CHILDREN: Children absorb more lead than adults, especially if they are hungry, and the damage is more permanent. Tiny particles of lead may be ingested from paint, air, water, soil or household dust. Sometimes, children will eat chips of peeling paint because they taste sweet. But often, poisoning occurs less obviously — simply by putting dusty hands or toys in their mouths or by breathing air with lead dust. Contamination can go unnoticed because lead cannot be smelled or tasted and often produces no symptoms.

2 DAMAGE AND DESTRUCTION OF CELLS: Once inside the body, the particles move through the bloodstream to tissues and organs, where the lead attacks the cells, damaging or destroying them. Even a tiny amount of lead is dangerous in children. Some research says children can tolerate just 6 micrograms of lead — approximately 1/17 the size of a grain of salt — per day.

3 IN THE BRAIN: This is where lead does the most damage, especially in children younger than 6. Lead can permanently disrupt growing brain connections and stay in soft tissue for weeks or months. The result is decreased intelligence, learning disabilities and behavior problems, such as hyperactivity. In 2003, researchers found children with lead levels of 10 micrograms had IQs 7.4 points lower than children with 1 microgram of lead. For each 10-microgram increase above that, children lose another 4.5 IQ points, the study said.

4 IN THE BONES: While softer tissues hold lead for months, bones retain the particles for decades. Bones hold very high concentrations of lead. Some medical experts think bones also shed high amounts of lead back into the bloodstream later in life, further damaging organs.

5 IN THE KIDNEYS: The kidneys serve as filters for liquid waste, but with lead particles, the kidney works like a sponge, holding high concentrations.



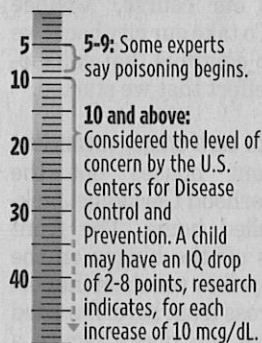
MARCIN SZCZEPANSKI/Detroit Free Press

DEALING WITH LEAD: Taylor Jackson, 12, plays dodge ball Friday in Detroit. Her mother, June Jackson, didn't realize until it was too late that Taylor had high lead levels. "I feel bad, like it's my fault," she said.

Understanding lead levels

Measured in micrograms of lead per deciliter of blood (mcg/dL):

WHAT LEVELS MEAN



WHAT HAPPENS AT EACH LEVEL

	Lead level			
	10-14	15-19	20-44	45+
Follow-up blood tests	✗	✗	✗	✗
Clean home for lead	✗	✗		
Referral to public health department		✗	✗	✗
Home inspection and evaluation			✗	✗
Chelation therapy required				✗

Sources: U.S. Centers for Disease Control and Prevention, Michigan Department of Community Health, Detroit Department of Health & Wellness Promotion

Detroit Free Press

"This is an educational crisis, and we should be doing something about it," said Randall Raymond, geographic information specialist for DPS who helped analyze the data.

School and health officials compared lead levels in children with student test scores on the 2008 MEAP exam to determine whether lead affected academic performance.

Such studies are rare because medical records are confidential. Schools usually don't know which kids are poisoned.

Analysts were able to find lead test results for nearly half the current students in DPS (not every child is tested) and determine the schools and areas of the cities most affected.

Results also showed that kids in special education had higher lead levels.

WSU nursing professor Lisa Chiodo studied a group of Detroit children from birth to age 20. The study showed that kids with higher lead levels had

lower IQs — findings consistent with decades of research nationally.

Children with lead poisoning can become discouraged. One study found these students are seven times more likely to drop out than those with low levels.

Because of problems with learning and memory, these children tend to be easily frustrated, inattentive and withdrawn, Chiodo said. By adolescence, this frustration can turn to aggression or delinquency.

Chiodo said it's time to do something to help. "We need curriculums for lead-exposed kids," Chiodo said. "We need interventions."

A family affected

The Cureton family is well aware of the damage lead causes.

Mom Jeanine Cureton, now 26, was 2½ when she was diagnosed with lead poisoning so

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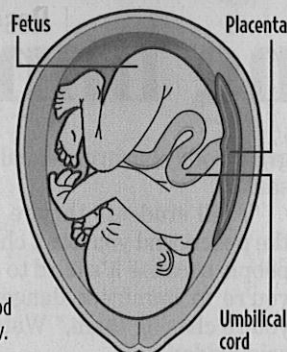
EFFECTS ON:

FETUSES

Lead particles in a pregnant woman can be passed to her fetus via the placenta. A fetus receives its nutrients from the placenta, which eliminates waste products through a filtering system.

ADULTS

Because their brains are fully developed, adults are at less risk of lead poisoning. However, if unchecked, adults may suffer from reproductive difficulty, nerve and digestive disorders, high blood pressure, memory loss and reduced hearing ability.



Sources: Research by MARSHA LOW/Detroit Free Press; U.S. Centers for Disease Control and Prevention; Morris James, Oakland County lead remediation project coordinator; Dr. William McClain, Wayne State University; www.webelements.com

Detroit Free Press

10 micrograms or higher.

Exposure to lead in young children damages developing brains — and its effects are permanent, so once a child has

high levels, the harm is done. Detroit has long led the state in lead poisoning, consistently accounting for more than 50% of Michigan's cases.

FROM PREVIOUS PAGE

severe she needed chelation, injections of chemicals that draw lead from the body. Her lead level was 87 micrograms.

"They told my mom not to expect much from me as far as learning ability," she said. "But I had a praying mom who worked with me."

Cureton didn't finish high school, reads at a grade-school level and struggles with memory problems, but she hopes to finish her education and dreams of being a nurse.

When their son Reggie was diagnosed as a toddler with lead poisoning, she and her husband, Reginald, thought they were doing all the right things, including frequently mopping floors and window sills to keep lead dust down.

But their second son, Maurice, now 7, also had high lead levels. The culprit was lead dust in the home's carpet, an assessment found.

That was two houses ago. The foreclosed house they bought in March has lead, too, tests show. The family hopes to remediate it with the help of ClearCorps, a nonprofit program that tests homes and helps families get rid of lead by stripping, sanding and repainting walls and trim.

In the meantime, the parents say they do everything they can to keep their youngest children from getting lead poisoning, and they work to stimulate the brains of the two old-

"THIS IS AN EDUCATIONAL CRISIS, AND WE SHOULD BE DOING SOMETHING ABOUT IT."

RANDALL RAYMOND, geographic information specialist for DPS, about the effects of lead on children

est. They also moved the older boys out of DPS — where Reggie had been having difficulties — to the private Detroit Merit Academy, where students get fruit and veggie snacks, journals to log how much they read at home and specialized learning plans.

"We work with our kids," said Reginald Cureton. That means reading books with them, working on phonics and

vocabulary, a computer program to teach them Spanish, trips to the Detroit Zoo, growing a garden and leaving motivation tips on the refrigerator. "We want to do things with and for our kids that we didn't have," Jeanine Cureton said.

'Gives me hope'

Experts say the Curetons are on the right track in working to minimize lead's damage.

Tomas Guilarte, chairman

"That study gives me hope," said researcher Miranda of Duke.

Miranda led a 2009 study in North Carolina that found lead

exposure helps explain the achievement gap between African-American and white students in reading tests.

Similar studies have produced similar results in Chicago, Massachusetts and Connecticut, Miranda said.

Kids need intervention at an early age to help them overcome some of the effects of lead poisoning, several experts said.

WSU's Chiodo and Teresa Holtrop, a pediatrician at Children's Hospital of Michigan, said they hope to get a grant this year for a computer program called CogMed. Studies have shown that working with

the program 30 minutes a day for five weeks can improve children's memories, which in turn improves learning.

The Curetons are upbeat about the prospects for Reggie and Maurice. Lately, the kids have been doing origami projects, folding paper into complex figures and shapes.

"Our kids are very persistent and don't give up," said Reginald Cureton. "Lead is still affecting them, but not to the point they can't move forward."

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■ **CARSTENS ELEMENTARY WORKS TO COMBAT EFFECTS OF LEAD. 8A**

DETROIT CHILDREN AND LEAD EXPOSURE

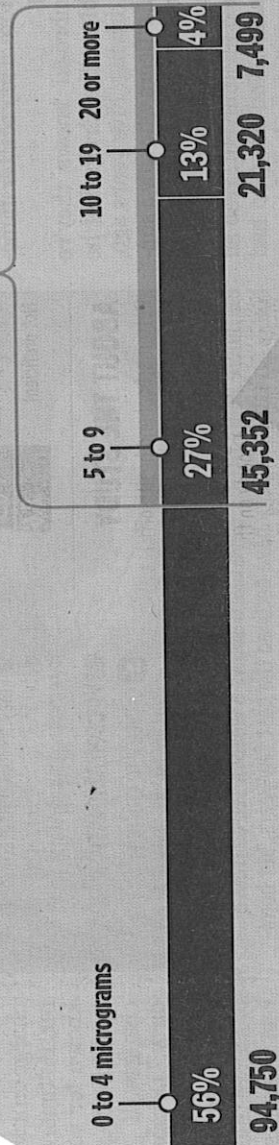
The red areas of this chart show where the highest lead levels were clustered in Detroit children, covering 169,000 children tested for lead poisoning between 1992 and 2008. Dark blue represents where low levels were found. It's based on where the children lived when their highest lead levels were recorded. On average, the middle (or median)

lead level for children tested on a Detroit city block was 4.7 micrograms over this period. A level of 5 micrograms or higher is considered troubling, according to lead research studies. The numbers on the map identify the Detroit public schools with the highest percentage of students with histories of lead poisoning.

HIGHEST LEAD LEVELS MEASURED BY CHILD, 1992-2008

Among the 169,000 Detroit children tested, more than 74,000 (44%) had lead levels of 5 micrograms or higher, which many lead researchers consider unsafe. Of those tested, researchers were able to identify roughly 39,000 Detroit Public Schools students, 58% of whom have a childhood history of lead poisoning.

74,171 DETROIT CHILDREN, **44%** OF THOSE TESTED, MEASURED AT OR ABOVE UNSAFE LEAD LEVELS



Note: Lead levels are measured in micrograms of lead per deciliter of blood. MARTHA THIERRY, KRISTI TANNER-WHITE and TINA LAW/Detroit Free Press

SCHOOLS WITH HIGH STUDENT LEAD RATES

In these 30 Detroit public schools, a Free Press analysis found that at least 35% of the total student population had confirmed lead levels of 5 micrograms or more. However, since there was no record of lead tests for half the students, that percentage is likely far higher.

- | | |
|----------------------------|-----------------------------------|
| 1 Blackwell Institute | 16 Law Academy |
| 2 Brewer Elementary | 17 Detroit Lions Alternative Ed. |
| 3 Bunche Elementary | 18 Loving Elementary |
| 4 Burns Elementary | 19 Marshall, Thurgood Elementary |
| 5 Campbell Elementary | 20 Owen Academy |
| 6 Carstens Elementary | 21 Pulaski Elementary |
| 7 Duffield Elementary | 22 Sampson Academy |
| 8 Farwell Middle School | 23 Scott, Brenda Middle School |
| 9 Glazer Elementary | 24 Sherrill Elementary |
| 10 Hancock Alternative Ed. | 25 Stewart Elementary |
| 11 Holmes, A.L. Elementary | 26 Thirkell Elementary |
| 12 Howe Elementary | 27 Van Zile Elementary |
| 13 Hutchins Elementary | 28 Wayne Elementary |
| 14 Hutchinson Elementary | 29 Westside Multicultural Academy |
| 15 Jamieson Elementary | 30 Wilkins Elementary |

Sources: Detroit Public Schools and the Detroit Department of Health & Wellness Promotion

COVER STORY LEAD'S POISONOUS LEGACY

Carstens tackles effects of lead head on

Despite high levels, students are thriving

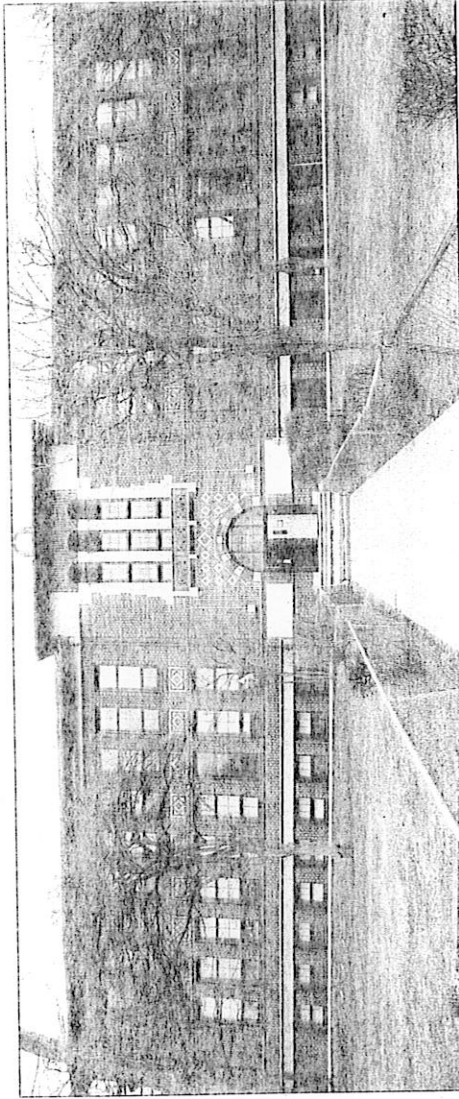
BY TIMA LAM
FREE PRESS STAFF WRITER

Carstens Elementary on Detroit's east side is in the heart of the city's lead belt, making it an unlikely symbol of optimism in the effort to educate children burdened by lead.

Crumbling homes filled with lead paint have poisoned Carstens students for decades. According to new city health and school data, 48% of the students have a confirmed history of high lead. The true percentage is likely much higher, since only about half of Detroit Public Schools students were tested.

Yet, more than 96% of third- and fourth-graders at Carstens passed the MEAP exams in reading and math last year, a much better showing than students citywide. Fifth-graders did less well, with 70% passing math and 80% passing reading tests — even so, those scores were 15 percentage points higher than the city average.

Principal Theresa Mattison has a philosophy that seems to make a difference: "We do whatever it takes," she said. There are weekly meetings



PATRICIA BECK/Detroit Free Press

According to new city health and school data, 48% of the students at Carstens Elementary in Detroit have a confirmed history of high lead levels.

"THEY HAVE TO KNOW THAT THEY CAN LEARN."

LINDA MACK, a special-education teacher, about children struggling with the effects of lead poisoning

involved," said teacher Rebecca Kelly. "We swoop down on problems."

None of this is aimed specifically at children who are lead poisoned, since such medical information is private. It's what the school does for all its kids.

But studies show that personal attention and a stimulating environment can help chil-

dren overcome, at least partially, damage from lead poisoning. Abby Phelps, a parent and community liaison for the school, said Carstens has worked on lead issues since the mid-1990s, when some students were hospitalized for extreme lead levels.

Staff got training from the health department and

calm here," said social worker Gail Nawrock, who has been at Carstens for 13 years. When lunchtime got chaotic, teachers started eating at the tables with the kids; now, it's calmer.

The school also focuses on out-of-school experiences, such as trips to Greenfield Village in Dearborn. "We want our kids to experience and do, not just sit and learn," she said. "It makes a difference."

Carstens, however, is on a list of DPS schools that might soon be closed.

Thomas Gullarte, who researches lead and is chairman of Environmental Health Sciences at Columbia University, said Carstens' efforts might make a difference, and other schools should emulate them.

"Prevention is obviously the first step," he said. "But environmental enrichment is a way to stimulate brain function."

His work has shown that it's possible to reverse brain deficits in rats harmed by lead, and he said researchers expect the same to be true of humans.

"I think what Carstens is doing is a good approach," he said. "It's the right thing to do, even if it takes time and resources. It's money well spent."

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