

Science Article of the Week: LEAD

Directions:

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Step 1: Read the article.

Step 2: Read the article again. List KEY WORDS for each section and write a one sentence summary using at least 4 or 5 of those key words.

Exposure to toxic metal can lead to devastating effects

By Chicago Tribune, adapted by Newsela staff 06.25.15 Word Count **800**

CHICAGO, Ill. — After growing up poor in a mostly African-American neighborhood of Cincinnati, the young adults had reached their early 20s. One by one, their brains were scanned in a hospital.

Those who had been exposed to lead as toddlers had experienced permanent and devastating changes.

The toxic metal had robbed them of gray matter. It is the substance in the brain that enables people to pay

attention, regulate feelings and control impulses. Lead also had scrambled the production of white matter that transmits signals between different parts of the brain.

The young adults were participants in a study at the University of Cincinnati. The study showed that scars left by lead have had a significant effect on the young people and their communities. As children, they struggled in school more than those who had not been exposed. As teens, they committed crimes more frequently.

“Lead sowed the seeds of their future,” said Kim Dietrich, a neuropsychologist who has been following the group of nearly 300 people since they were born in the late 1970s.

Key Words:

Summary Sentence:

Lead Continues To Harm Children

She said that lead is a barrier to "normal development, making smart decisions and success."

People have known for centuries that lead is poisonous. Removing it from gasoline and paint has dramatically reduced exposure for American children.

Yet lingering dust from paint and deposits from old vehicle emissions continue to harm thousands of children in older industrial cities like Cincinnati and Chicago.

Possible effects of lead exposure

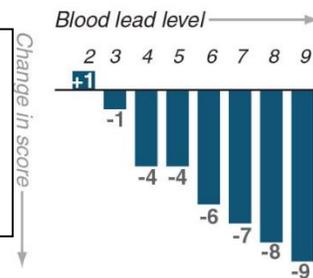
Recent studies have underscored the wide-ranging impact of lead pollution on cities like Chicago. In April, researchers reported in the journal *Environmental Health* that Chicago students who were exposed to lead in early childhood had lower test scores in third grade than other students. As exposure increased, the gap widened. Another study, from 2012, found that aggravated assault rates rose and fell in Chicago on a curve strikingly similar to the pattern seen as leaded gas emissions increased and then declined, about 20 years earlier.

Blood lead levels and test scores

Changes in third-grade ISAT performance as blood lead levels increase, relative to average score for children with the lowest lead levels at age 0-6. Blood lead level measured in micrograms per deciliter.

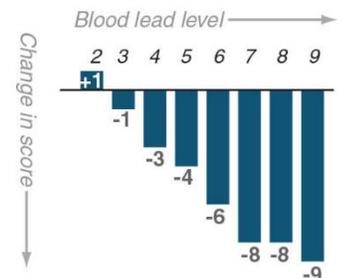
Math scores

Average score of students with a blood lead level of less than or equal to 1 mcg/dL: 161

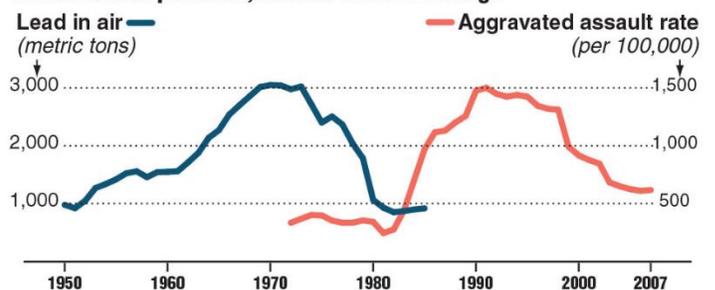


Reading scores

Average score of students with a blood lead level of less than or equal to 1 mcg/dL: 159



Trends in lead pollution, assault rates in Chicago



Source: Anne Evens, University of Illinois at Chicago; Howard Mielke, Tulane University School of Medicine; Sammy Zahran, Colorado State University
Graphic: Chicago Tribune, Tribune News Service

Early exposure harms children in ways that don't show up until years later. Money has to be spent on health care, special education and law enforcement.

Key Words:

Summary Sentence:

Lead Is A Problem In Poor, Crime-Ridden Neighborhoods

Last month, an investigation by the Chicago Tribune newspaper found that lead is a major problem in poor neighborhoods with a lot of crime. In 1995, the children in these neighborhoods were tested. More than 80 percent of them had dangerous lead levels.

Today those children are in their early to mid-20s, when criminal behavior peaks.

There is more and more evidence of links between lead poisoning, poor school performance and crime. Some scientists are starting to focus on lead pollution as a key factor in Chicago's violence.

Robert J. Sampson is a Harvard University researcher who has been studying Chicago for more than 20 years. Sampson recently added information on lead to his research on poverty, education and crime in Chicago neighborhoods. A map of lead poisoning rates among children younger than 6 in 1995, for instance, looks very similar to a map of assault rates in 2012, when those children were 17 to 22 years old.

He said these "astounding levels of lead poisoning" are part of the cycle of poverty that keeps people trapped in poverty for generations.

Key Words:

Summary Sentence:

Many Leaders Thought Problem Was Solved

People who make laws seem to regard lead pollution as a problem solved long ago. During the past five years, national and state leaders have cut the amount of money spent to screen children, inspect buildings and get rid of lead.

Children ages 5 and younger are the ones suffering more than anyone else. Many of these children live in neighborhoods that are mostly African-American.

Another study looked at the lead tests of thousands of children born in Chicago from 1994 to 1998. The researcher who did the study is named Anne Evens. She compared the results with how the children performed on standardized tests in third grade.

Her study found that being around lead during early childhood increased the chance that a student would fail reading and math tests. This was true even when controlling for other factors such as poverty, race, birth weight and the mother's education level.

Key Words:

Summary Sentence:

Study Results Are Shocking

What Evens found is shocking: At three-quarters of Chicago Public Schools, the average lead level of third-graders was higher than what the government says is safe.

Why is third grade so important? That's when children begin to use reading to learn other subjects, and studies show students who fail to master reading skills during such a critical year are more likely to fall behind in later grades and drop out of high school. Dropouts are much more likely to end up in jail than to ever graduate.

Some people know that children exposed to lead as toddlers are more likely to act out. They also have trouble staying on task and they struggle to work well with classmates.

The link between childhood lead exposure and violent behavior is well-established, both in animal research and human studies. Small doses can reduce IQ. They can also cause parts of the brain to temporarily stop working, in particular the areas that help control violent behavior.

"Of all the problems that affect kids in these neighborhoods, lead is the easiest to solve," Evens said.

Key Words:

Summary Sentence: