Childhood Lead Exposure in the United States: CDC's Role in Prevention, Education, and Surveillance

Environmental Health NEXUS Webinar

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Overview

- Introduction to childhood lead exposure
- Sources of lead in children's environments
- Description of populations at higher risk
- Current trends among children in the United States
- Prevention strategies
- Current initiatives at CDC

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Lead is a toxic (poisonous) metal.

- **Lead exposure:** When a child comes in contact with lead by swallowing or breathing in lead or lead dust.
- Even low levels of lead can adversely affect the health of children.

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In children, exposure to lead can cause harm.

- Damage to the developing brain and nervous system
- Learning and behavior problems
- Slow growth and development
- Hearing and speech problems

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Children have the greatest risk of exposure and negative health impacts.

- **Key routes of lead exposure:** inhalation and ingestion
- Risk factors include
  - Developing body systems and detoxification processes
  - Unique behavioral factors such as mouthing and crawling
  - Greater lead absorption per body size

Children are primarily exposed to lead from paint, soil, and water.

- **Lead-based paint** in homes and buildings built before 1978
- **Contaminated soil f**rom exterior lead-based paint, car exhaust, and factories that use lead
- **Contaminated drinking water** delivered through lead plumbing materials

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Children can be exposed to lead from other sources.

- Take-home lead exposure from certain jobs
- Traditional medicines and cosmetics
- Remedies used in Ayurvedic medicine
- Candy and candy wrappers
- Spices
- Toys and jewelry
- Pottery and ceramic dishes

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No safe blood lead level (BLL) has been identified.

- The amount of lead in blood is referred to as **blood lead level (BLL)**, which is measured in micrograms of lead per deciliter of blood (µg/dL).
- CDC uses a blood reference value of **5 µg/dL** to identify children with BLLs that are higher than most children.
  - This level is based on the U.S. population of children ages 1-5 years who are in the highest 2.5% of children when tested for lead in their blood based on the National Health and Nutrition Environmental Survey (NHANES).

Testing children for lead exposure

- A **blood test** is the easiest way to determine if a child has been exposed to lead.
  - Most children with any lead in their blood show no symptoms.
  - **Two types of tests may be used:** finger prick (capillary test) or venous blood draw.
  - Based on the child's blood lead level, healthcare providers can recommend follow-up actions and care.

What to expect when receiving a blood lead test

Some children are more likely to be exposed to lead.

- **These include children**
  - Who live in housing built before 1978
  - From low-income households
  - From racial or ethnic minority groups
  - Who are immigrants, refugees, or recently adopted from outside of the United States
  - Whose parents/caregivers may be exposed to lead through their work or hobbies

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Lead can pass from a mother to her unborn baby.

- Lead in the blood during **pregnancy** can
  - Increase risk for miscarriage
  - Cause the baby to be born too early or too small
  - Hurt the baby's brain, kidneys, and nervous system
  - Cause the child to have learning or behavior problems

- **Source**: ATSDR Toxicological Profile for Lead, https://www.atsdr.cdc.gov/toxprofiles/tp13.pdf.

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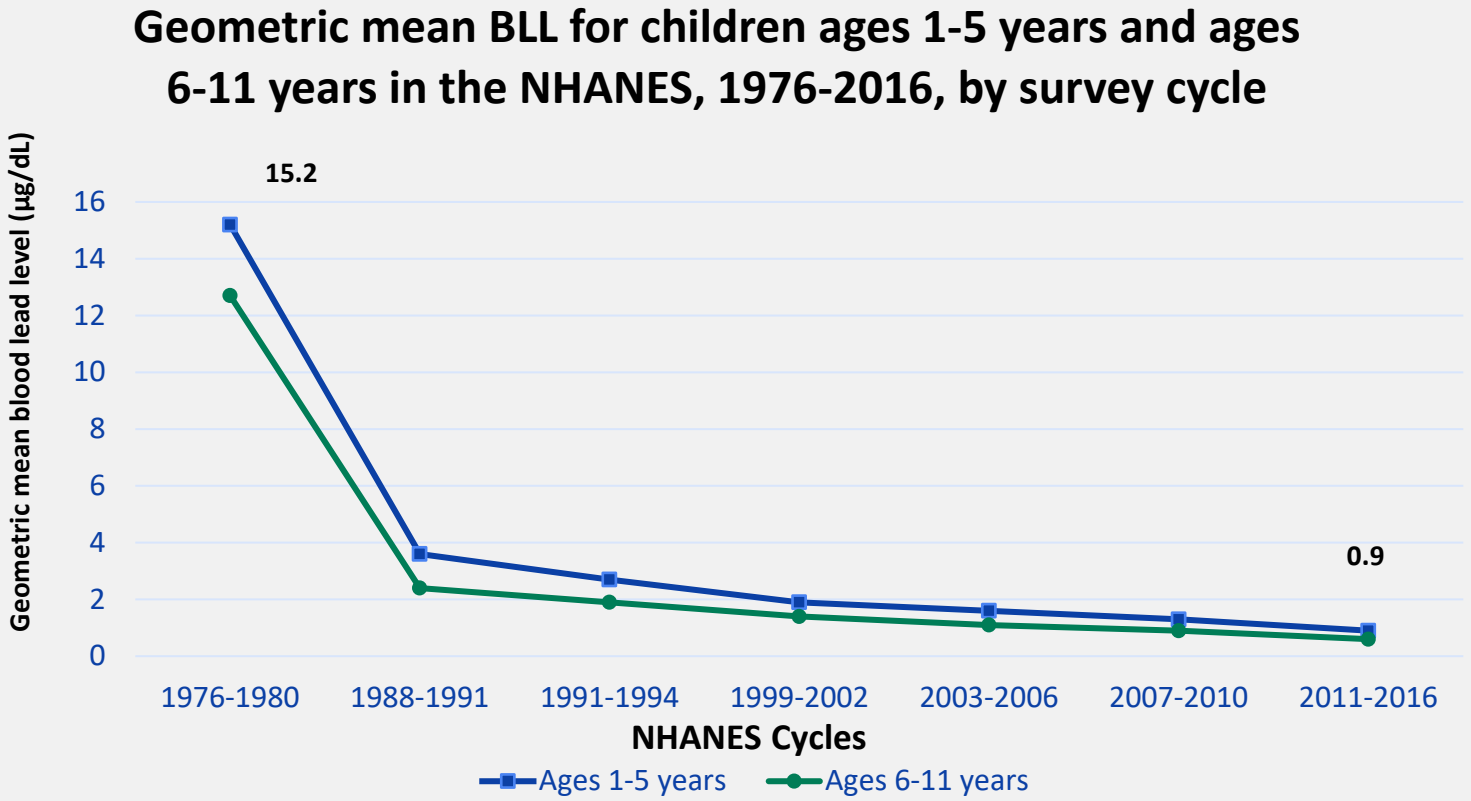
Blood lead levels in U.S. children have declined.



Disparities in lead exposure exist.

- **At-risk children** live in neighborhoods characterized by
  - Older homes
  - Lower family incomes
  - Lower housing values
  - Higher population densities
  - Higher proportions of rental properties
  - Higher proportions of minority, immigrant, and refugee residents

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Disparities in blood lead levels exist.

- **Elevated blood lead levels** are more prevalent among children
  - From racial and ethnic minority groups
  - From low-income households
  - Children who live in housing built before 1978
- Children from **racial and ethnic minority** groups are more likely to live in conditions where there is greater likelihood of exposure.

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There is still more work to be done.

- Millions of children are still exposed to lead.
- Not all children are tested for blood lead, even when required by law.
- Adverse health and developmental effects are being identified at increasingly lower blood lead levels.
- Children can be exposed from multiple sources.

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A parent's perspective:

"My son was diagnosed with an **elevated blood lead level or 11µg/dL** when he was 1 year old. He was tested for ADHD at the age of 8. He exhibited severe symptoms of lead exposure, struggled through school, and **required a great deal of academic support** from the school. He attempted a year and a half of college, but that experience proved too much. He lacks confidence and knows that any career he chooses will require some form of further education. **His fear and lack of self-confidence keeps him from moving forward with hopes**."

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Lead exposure is preventable with organized effort.

- Several **steps** can be taken to
  - Prevent exposure before it occurs
  - Prevent further exposure, if a child has already been exposed
  - Mitigate the effects on the child's health

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Preventative actions for parents, caregivers, and others

- **Parents and caregivers can**
  - Learn the common sources of lead.
  - Test their home for lead.
    - Check with your landlord if you rent.
  - Renovate and repair safely.
  - Take everyday steps to stay healthy.
  - Talk to their child's healthcare provider.

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Preventative actions for healthcare providers

- **Healthcare providers can**
  - Learn about the causes, symptoms, and effects of childhood lead exposure.
  - Talk to their patients about lead exposure.
  - Ensure children under the age of 6 receive required blood lead tests.
  - Connect exposed children to recommended services.

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Preventative actions for public health professionals

- **Public health professionals can**
  - Learn about lead hazards and risk factors in their community.
  - Create awareness and a sense of urgency to prevent lead exposure.
  - Organize and partner.
  - Serve as a resource for parents and healthcare providers.

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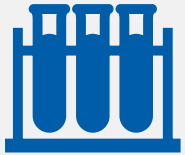
CDC's Childhood Lead Poisoning Prevention Program (CLPPP)

- **Vision:** To eliminate childhood lead poisoning as a public health problem.
- **Mission:** To reduce blood lead levels in children and differences in average risk based on race and socioeconomic status

CLPPP focuses on strengthening four core strategies.



Blood lead testing and reporting

Surveillance of child blood lead levels

Targeted, population-based interventions

Linkages of lead-exposed children to recommended services

CDC supports prevention activities nationwide.

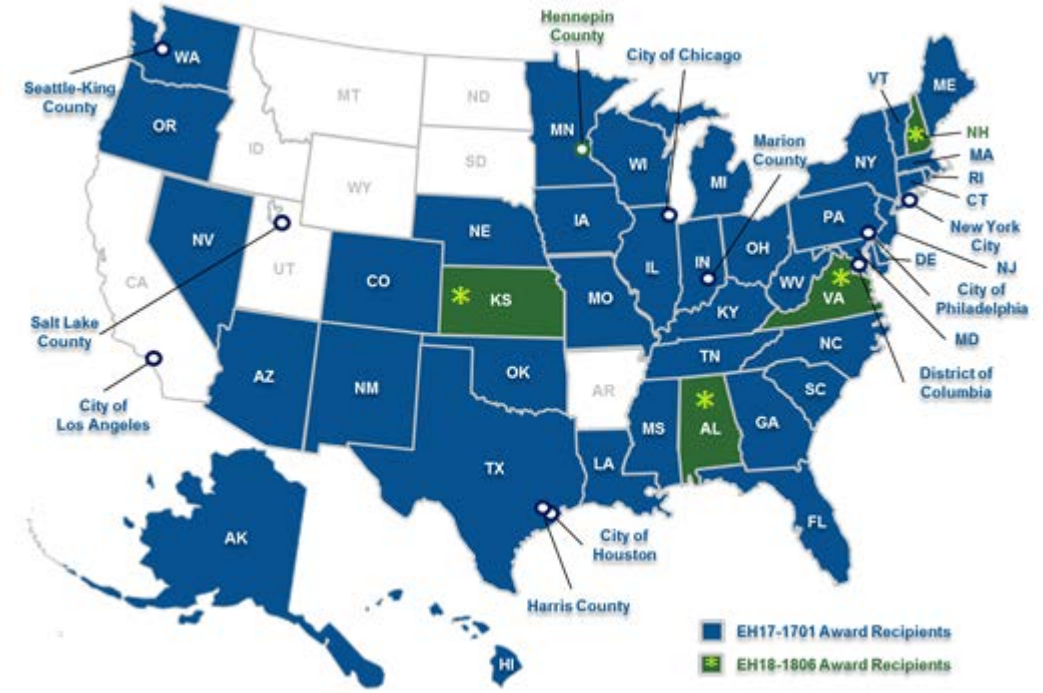


Figure: Fiscal year (FY) 2018 Childhood Lead Poisoning Prevention Cooperative Agreement Recipients

CDC-funded partners have achieved many successes.

150

additional children with elevated blood lead levels identified in Chicago

200%

increase in blood lead testing in one county in Missouri

3,500+

uses of a new interactive mapping tool in Arizona

330+

children given blood lead tests at events in Seattle

17,848

referrals made to critical health and development services in Flint, Michigan

4,000

pamphlets distributed to parents in Delaware

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Commemorating 30 years of supporting childhood lead poisoning prevention activities.

- CDC began funding state and local childhood lead poisoning prevention programs in 1991.
- **Theme:** Continuing Our Commitment to Eliminate Childhood Lead Exposure

Beginning of a new funding cycle

- **CDC-RFA-EH21-2102:** Childhood Lead Poisoning Prevention and Surveillance of Blood Lead Levels in Children
- **Project period:** September 30, 2021 to September 29, 2026
- Eligibility expanded to include public entities such as territories.
- 62 state and local health departments awarded funding.

Lead Exposure and Prevention Advisory Committee

- **Consists of 15 Federal and non-Federal experts charged with:**
  - Reviewing federal programs and services available to lead-exposed individuals and communities.
  - Reviewing current research on lead poisoning to identify additional research needs.
  - Reviewing and identifying best practices, or the need for best practices, regarding lead screening and prevention of lead poisoning; and
  - Identifying effective services for individuals and communities affected by lead exposure.
  - More information is available at: https://www.cdc.gov/nceh/lead/advisory/lepac.htm.

Advancing the science of lead exposure prevention

- **Call for papers:** CDC and the American Journal of Public Health (AJPH) Supplement
- **Title:** “Ubiquitous Lead: Risks, Prevention, Mitigation Programs, and Emerging Sources of Exposure.”
- **Deadline:** January 30, 2020

Redesigned Lead Poisoning Prevention Training Center

- **Audience:** public health staff tasked with reducing lead exposure in their communities
- **Training modules will cover:**
  - Foundations of lead exposure
  - Strategic planning and implementation of key strategies
  - Epidemiology and surveillance of lead exposure
  - Developing community partners and outreach
  - The science of lead exposure: Using data for action
- **Anticipated launch:** October 2021

Join us for National Lead Poisoning Prevention Week!

- Annually, the last full week in October.
- Hosted by CDC, HUD, and EPA.
- **Theme:** “Get the Facts, Get Your Home Tested, and Get Your Child Tested.”

Lead Free KIDS for a Healthy Future

Resources available at www.cdc.gov/nceh/lead

State and local programs directory

Frequently asked questions

Data and statistics

Laboratory guidance

Publications, guidelines, and policy resources

Communication materials

Resources from our partners

- **Guidelines for controlling lead-based paint hazards in housing**
  - https://www.hud.gov/program_offices/healthy_homes/lbp/hudguidelines
- **Lead disclosure information for homebuyers and renters**
  - https://www.epa.gov/lead/real-estate-disclosures-about-potential-lead-hazards
- **Find a certified renovation and lead dust sampling technician firm**
  - https://cfpub.epa.gov/flpp/pub/index.cfm?do=main.firmSearch
- **Photos and descriptions of recalled products**
  - www.cpsc.gov/recalls
- **Information on lead exposure for adults**
  - https://www.cdc.gov/niosh/topics/lead/jobs.html

Summary

- No safe blood lead level for children has been identified.
- Protecting children from lead exposure is important to lifelong good health.
- Individuals, public health professionals, and healthcare providers each play a key role.
- CDC is committed to eliminating childhood lead exposure as a public health problem.

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For more information:

CDC's Childhood Lead Poisoning Prevention Program

https://www.cdc.gov/nceh/lead/

For more information, contact NCEH/ATSDR
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.atsdr.cdc.gov www.cdc.gov
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