

2024 Lead Report

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City of Cincinnati Health Department
Environmental Health
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Image 1: From WHO, Four things you should know about lead



This document is updated annually
with the most recent information on
hazards, exposures, research, and data.

ABOUT THIS REPORT

This report is intended to provide background and data from the Cincinnati Health Department's Childhood Lead Poisoning Prevention Program (CLPPP) to the public and local policymakers. The purpose is to provide information about childhood lead poisoning in Cincinnati, why it is a hazard, who is affected, and what the Cincinnati Health Department (CHD) is doing to protect the health and safety of the community. This document is published annually with the most up-to-date information and research in the field of lead poisoning prevention.

TABLE OF CONTENTS

ABOUT THIS REPORT	2
TABLE OF CONTENTS	2
DATA PARAMETERS AND LIMITATIONS	2
DEFINITIONS	3
DATA AT A GLANCE	3
ABOUT LEAD	4
Where is Lead Found	4
Exposures	6
How Exposures Happen.....	6
Effects of Lead Exposures	6
Prevention Measures.....	7
CHILDHOOD LEAD PREVENTION PROGRAM	8
Ohio	8
Cincinnati	8
Childhood Blood Lead Testing.....	8
Tests.....	9
Results.....	10
CHILDREN WITH ELEVATED BLOOD LEAD LEVELS	10
REFERENCES.....	13

DATA PARAMETERS AND LIMITATIONS

The data analyzed in this report is from the Blood Lead Testing Secure (2005-Present) dataset housed and managed by DataOhio, the official State of Ohio data platform. Cases are identified as the highest recorded test per patient identification (PATIENT_ID) per lifetime (BEST_TEST_FOR_LT). Only venous testing defines a confirmed elevation in the state of Ohio per [Ohio Administrative Code 3701-30-03](#). Data is limited to cases within Cincinnati City jurisdiction (PATIENT_CITY= CINCINNATI) and to patients under 72 months of age (PATIENT_MON<=72) at the time of testing. Location is determined by the patient's home address. This could be a limitation of the data as exposure can occur outside the home. ^[1,2]

In 2021, the national guideline on lead reference value changed the threshold for an elevated blood lead level case from 5 µg/dL to 3.5 µg/dL. Ohio Department of Health (ODH) adopted 3.5 µg/dL as the threshold for an elevated case in retroactively adopted the change in 2023. To accurately assess the health of the population, for the 2024 annual report, CHD will evaluate 3.5 to 5 µg/dL, 5 to 10 µg/dL, and 10 µg/dL and greater. Data from 2024 is provisional and subject to change. ^[3]

Population data is taken from the *American Community Survey Table: B09001, Population Under 18 Years by Age (5-Year Estimates)* from 2015 to 2023 for 'Children Under Six' for Cincinnati City Jurisdiction. Maps are based on American Community Survey 2018-2023 5-Year population data by age and census tract for children under six. Due to the small population of children under six in each census tract and within the city, the margin of error can be large. ^[4]

DEFINITIONS

- **Blood Lead Level (BLL):** The concentration of lead within the blood.
- **Blood Lead Reference Value (BLRV):** The threshold at which a blood lead test is considered elevated. References children aged one to five with EBL in the 97.5 percentile.
- **Capillary Blood Draw:** Often a finger stick or heel stick of a capillary vessel to collect a small quantity of blood for testing.
- **Census Tracts:** A unit of measure of area, often small, ranging only a few city blocks or streets based on population density.
- **Confirmed Elevated Blood Lead Level (Confirmed EBL):** The concentration of lead in the blood at a rate equal to or greater than 5 µg/dL by venous blood draw.
- **Elevated Blood Lead Levels (EBL):** The concentration of lead in the blood at a rate equal to or greater than 3.5 µg/dL, "a blood level of concern" that should prompt public health action.
- **Hand-to-Mouth Behavior:** Contact between hands and the mouth or the area around the mouth (the perioral area) including sucking or chewing on fingers/thumb or fist.
- **High Risk Zip Code:** Any ZIP code partially/fully containing a hot census tract.
- **Hot Census Tract:** Any census tract in which at least 12% of the children are predicted to have blood lead levels of 3.5 µg/dL or greater.
- **Lead-Contaminated Housing:** Housing that is deemed unsafe because the home contains lead hazards such as contaminated water or deteriorating lead-based paint.
- **Lead Dust:** surface dust contaminated with or containing mass concentrations of lead.
- **Maximum Contaminant Level (MCL):** legal threshold limit on the amount of substance that is allowed in the public water systems under the Safe Drinking Water Act.
- **Micrograms per Deciliter (µg/dL):** How much mass of a contaminant (lead) exists in a deciliter of liquid (blood).
- **Object-to-Mouth Behavior:** Contact between objects and the mouth or the area around the mouth (the perioral area) including sucking or chewing on toys, furniture, or surfaces.
- **Venous Blood Draw:** When at least 1mL of blood is taken from a vein for blood testing.

DATA AT A GLANCE



CHILDREN TESTED

7198 children under age six were tested for lead in Cincinnati in 2024. That is 30.35% of all children under six in Cincinnati.



3.5-5 µg/dL

86 Children had confirmed blood lead levels of 3.5-5 µg/dL. This was 1.19% of the total tested in 2024.



5-10 µg/dL

92 children had confirmed blood lead levels of 5-10 µg/dL. This was 1.28% of the total tested in 2024.



10 µg/dL OR GREATER

47 children had confirmed blood lead levels of 10 µg/dL or greater. This was 0.68% of the total tested in 2024.



RISK ASSESSMENTS

24 properties had risk assessments performed in 2024 to identify possible lead exposures within the home.

ABOUT LEAD

Where is Lead Found

Lead (Pb) is a naturally occurring environmental hazard that can have negative health effects on humans and animals. Lead compounds have previously been used as a pigment in paints, dyes, and lead alloys. Additionally, lead has been found in water pipes, gasoline anti-knock additives, ammunition, fishing lures, cosmetics, jewelry, teas, ceremonial powders, spices, soil, and pesticides.

Lead Paint

Lead was added to paint as lead carbonate and lead oxides for its adhesion, drying, pigmenting, and covering abilities. Lead-based paint was used extensively before 1960, especially on woodwork and high-gloss surfaces since it was more vibrant and durable than other paints of the time. Lead-based paint was banned by the United States Consumer Product Safety Commission in 1978, yet housing contaminated by lead-based paints remains a significant public health problem. The Centers for Disease Control and Prevention (CDC) estimates that at least 29 million lead-contaminated homes remain in the United States today, with 2.6 million being home to young children. In 2024, roughly 42% of Cincinnati's housing stock is estimated to be built prior to 1978, meaning roughly 69,450 homes could have deteriorating lead-based paint hazards. Lead paint chips and lead dust are often found where lead-based paint may be worn away by rubbing on surfaces such as doorways, windows, floors, porches, stairways, and cabinets. [5, 6, 7]



Water Pipes



Lead water service lines became common in U.S. cities starting in the late 1800s. Lead pipes were chosen over cheaper materials, like iron, due to their increased longevity and flexibility. However, deteriorating or corroding lead pipes, lead-soldered plumbing, chrome-plated faucets, and galvanized iron pipes can leach lead into drinking water that cannot be seen, smelled, or tasted. Once health risks were known, officials began restricting lead pipe use by the 1920s. Cincinnati stopped installing lead in its service lines in 1927 and has since been replacing old lines. Despite these efforts, Cincinnati ranked 10th in the nation of cities with the most lead service lines from a study done by the Environmental Defense Fund in 2024, based on 2021 reported data. In 2017, Greater Cincinnati Water Works (GCWW) inventoried the city's service lines, identifying 52,129 lead or unknown service lines. As of August 13, 2025, 36.0% have been identified as non-lead or replaced with copper, leaving 33,449 active or unknown service lines in

use today. In December 2021, Cincinnati City Council voted to cover all costs of replacing residential lead service lines. In January of 2025, GCWW was awarded the Ohio City and County Management Association Citizen Participation Award, acknowledging the Lead Service Line Replacement Program's significant community participation. The program averages approximately 90% participation on projects throughout Cincinnati. If you receive water through GCWW, and are interested in determining whether a waterline includes lead pipes, please see [GCWW lead map](#). All Cincinnati residents are eligible to receive free water test kits [from GCWW](#). [8, 9, 10, 11, 12]

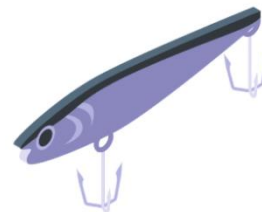
Gasoline Additives

Lead in the form [Tetraethyl lead \(Pb\(C₂H₅\)₄\)](#), was first added to gasoline in 1921 as an anti-knock additive to improve fuel efficiency. Due to concerns about air pollution and health risks, this type of gasoline was phased out for automotive use with the [Clean Air Act of 1970](#) and then banned in the U.S. in 1995. On October 27, 2011, the United Nations Environmental Program (UNEP) announced a global eradication of leaded gasoline for cars and trucks, with the last reserves officially emptied in Algeria in July 2021. Tetraethyl lead is still used in aviation gasoline (avgas) despite the EPA determining that "lead emissions to air from certain aircraft engines cause or contribute to air pollution which may reasonably be anticipated to endanger public health and welfare." The Federal Aviation Administration (FAA) has enforced improved emission standards over the past 30 years, with an industry-wide goal to remove lead from avgas by 2030 through the Eliminate Aviation Gasoline Lead Emissions (EAGLE) initiative. In a 2019 report, approximately 167,000 aircraft in the U.S., and a total of 220,000 aircraft worldwide rely on lead avgas. When used, leaded gasoline is aerosolized into a gas vapor that can be inhaled and topical exposure to tetraethyl lead can be absorbed easily through the skin. The compound tetraethyl lead is acutely toxic, meaning if inhaled sudden and severe outcomes in both children and adults, including insomnia, weakness, anxiety, tremors, bradycardia, hypotension, hypothermia, nausea, confusion, hallucinations, psychosis, mania, convulsions, comas, and death can occur. [13, 14, 15, 16, 17, 18, 19]



Ammunition and Fishing Lures

Lead poisoning in wildlife was first reported in 1894 from lead-based ammunition and fishing lures. Lead is used in ammunition and fishing lures because of its weight and shaping ability. When left in the environment, these lead items navigate into the food chain via birds and fish. Raptors and scavenging birds eat the remains of hunted or fished animals and are poisoned by lead fragments embedded in the carcasses, which are then distributed throughout the body by digestion. Waterfowl and terrestrial game birds that have gizzards for grinding up food are at risk of being poisoned by ammunition. Lead fishing tackle is the leading cause of death for common loons and swans, and poses a risk to more than 70 other species in the U.S. Eating game, specifically birds and fish, killed with lead shots or lead lures pose a serious risk to a person's health and the health of the environment by introducing lead into the food chain. [20, 21, 22, 23]



Cultural Items and Cosmetics



The U.S. has strict safety standards that screen products for heavy metals prior to distribution. However, unregulated products can often still be imported from other countries where lead is not regulated in consumer products. Check for state or federal agency safety labels on products before use or check the [Consumer Product Safety Commission \(CPSC\)](#) website for current products that have been recalled for lead contamination or if there is question on the safety of a product. [24, 25]

Spices and teas can be contaminated when grown in areas with polluted soil from leaded gasoline, battery manufacturing plants, and mines with contaminated water runoff. In unregulated countries, lead can be added to spices and powders to increase weight and brighten the color. Lead has been found to be added in traditional powders and tablets given for arthritis, infertility, upset stomach, menstrual cramps, and other illnesses. Lead has also been found in products typically used in cosmetics or in religious ceremonies. For example, in some Hindu and Sikh traditions, married women wear red sindoor powder in the parting of their hair to indicate marital status. Other cosmetic products use lead for pigmentation purposes, such as kajal and kohl, which are used in traditional eyeliners in Asian and Middle Eastern countries. [24, 26]

Jewelry

Lead is sometimes incorporated into jewelry to enhance its weight, brightness, and stability. While more common in antique or plastic jewelry, it is often considered safe for adults to wear and handle. However, children are at risk of exposure due to hand-to-mouth contact after handling jewelry or sucking, biting, or chewing on jewelry, or accidental swallowing of small jewelry components. [27]



Lead in Soil and the Environment

Lead can naturally exist in soil at low levels but is found in higher levels in cities due to the increase in human activities. Lead does not break down over time, so lead from the past can still pose a risk today. Lead can settle in the soil near roadways and airports from leaded gasoline, near buildings from previous lead paint deterioration, and in hunting grounds or outdoor shooting ranges from lead lures and ammunition. Industrial sites may also release lead into the environment. Lead-contaminated soil particles can be tracked into the home as lead dust on shoes, clothes, or pets. [28]



Pesticides



Chemicals such as organophosphorus pesticides (e.g., tebufenozide, homofenazine, etc.) that are used for eliminating pests or insects from homes and outdoor spaces may contain toxic heavy metals, including lead. Spraying aerosol pesticides can cause lead exposure through inhalation. Additionally, spraying kitchen surfaces near food can cause lead ingestion once food becomes contaminated. Avoid this risk of exposure by purchasing pesticides that are free of toxic metals and contain safer ingredients. Also, switching from aerosols to powders, soaps, and oils can minimize risk of inhalation. Safe, non-toxic pesticide or insecticide options can include boric acid powder, potassium soap, and neem oil. [29, 30]

Exposures

Childhood lead poisoning is the leading preventable environmental disease in children. According to CDC, there is no safe blood lead level (BLL) in children, even low levels of lead in the blood have been shown to negatively affect a child's neurological development. Damage from lead poisoning can be permanent. Lead poisoning often develops gradually, becoming well established before symptoms become apparent. [31, 32]

How Exposures Happen

Lead exposure occurs when a person comes in contact with lead by touching, swallowing, or breathing in lead or lead dust. Lead poisoning occurs when lead builds up in the body over months or years, and because of the slow accumulation of lead, children may have no obvious immediate symptoms. [31, 32, 33, 34]

Childhood lead poisoning in the U.S. is most often caused by chronic exposure to lead-based paint. Lead-based paints were banned for residential use in 1978. However, homes built before this time can contain some level of lead-based paint. When lead paint peels and cracks due to rubbing or friction, lead paint chips and lead dust form. Children, specifically babies and toddlers, are at highest risk of inadvertent lead ingestion. Hand-to-mouth or object-to-mouth behavior includes sucking or chewing on objects that lead dust or paint chips may settle on. This includes hands, fingers, toys, or surfaces, which can result in unintended ingestion of particles. [31, 32, 33, 34]

Adult lead poisoning in the U.S. is most often caused by occupational exposures. The National Institute for Occupational Safety and Health estimated that roughly 3 million American workers are at risk of lead exposure. Professions at high risk include smelting, battery making, soldering, stained glass manufacturing, brass foundry work, lead pipe abatement, and construction and demolition workers. Severe exposures often occur in construction and demolition workers who are involved in the demolition or renovation of steel structures coated in lead paint such as bridges and elevated highways. [34, 35, 36]

Effects of Lead Exposures

Children younger than six years are especially vulnerable to lead as exposure can have serious permanent effects on neurological and physical development. Signs and symptoms in children include developmental delay, lower IQ, learning difficulties, irritability, loss of appetite, weight loss, sluggishness, fatigue, abdominal pain, vomiting, constipation, hearing loss, seizures, and pica (eating things that are not food). Signs and symptoms of lead poisoning could occur from current exposures or latently, long after previous exposures. Many signs and symptoms of lead poisoning can be misidentified or go unnoticed. The only way to determine lead poisoning is with a blood test. [31, 32, 33, 34]

In adults, lead poisoning can be dangerous. Elevated blood lead levels (EBLL) can result in high blood pressure, joint and muscle pain, difficulties with memory or concentration, headache, abdominal pain, mood disorders, reduced sperm count, and abnormal sperm. [31, 33, 34]

Pregnant individuals exposed to lead can pass lead to their fetus in utero. This exposure before birth can cause babies to be born prematurely, have lower birth weights, and have slowed growth and development. EBLL during pregnancy can cause miscarriage and stillbirth. Lead can also be passed from mother to baby through breastmilk. [31, 33, 34]



Image 2: Baby engaging in object-to-mouth behavior

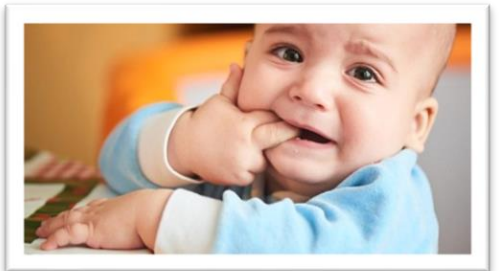


Image 3: Baby engaging in hand-to-mouth behavior

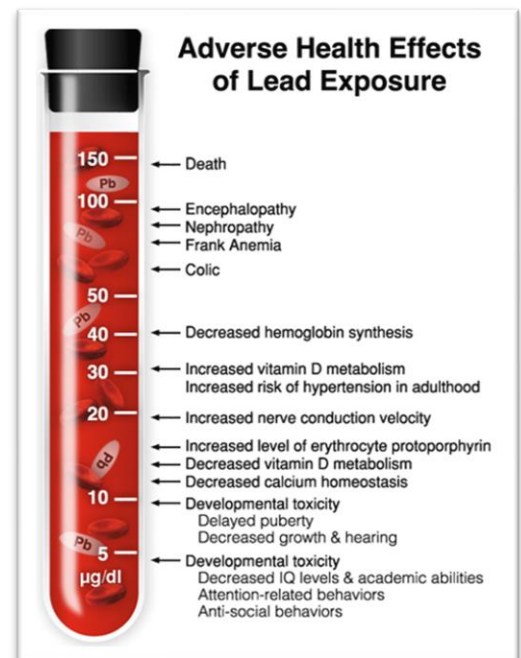


Image 4: Taken from Adair County (MO) Health Department. Outlines at what level of lead per deciliter of blood adverse health effects can occur. There is no safe level of lead in the blood.

Prevention Measures

Lead exposure occurs when a person comes in contact with lead by touching, swallowing, or breathing in lead or lead dust. Childhood lead poisoning in the U.S. is usually caused by exposure to lead-based paint in the form of lead paint chips and lead dust. Children, specifically babies and toddlers, are at the highest risk of inadvertent lead ingestion of lead particles from hand-to-mouth or object-to-mouth behavior. Mitigating lead dust through regular cleaning can help reduce in-home exposures. Adult lead poisoning in the U.S. is usually caused by occupational exposure. Adults with exposure to lead particles need to take precautions to avoid bringing lead hazards into the home. ^[31, 34, 35, 36, 37]

To prevent lead poisoning, adopting a layered approach of preventative behaviors can mitigate the risk. Removing lead hazards from the home, maintaining proper cleaning, and eating a healthy diet can help reduce the chance of lead poisoning. ^[31, 33, 34]

1.) Removal of Lead Hazards: Removal of lead hazards is the most effective way to ensure that children do not experience the long-term effects of lead poisoning. Removing products such as toys or furniture coated in lead paint can greatly decrease the amount of lead dust within the home. Removal of other household products that may contain lead, such as lead ammunition, lead fishing lures, imported cosmetics, homemade glazed pottery, jewelry, imported teas, ceremonial powders, and imported spices can help mitigate lead exposure. ^[6, 34]

2.) Do Not Bring Lead Dust into the Home: Lead dust can be tracked into a home on shoes, clothes, or pets from outdoor lead hazards or occupational exposure. ^[6, 36]

3.) In-Home Cleaning: Cleaning the home to remove any lead particles that may reside in dust or soil residue can greatly mitigate the risk of lead poisoning in children. Use the following cleaning methods to safely and effectively remove lead: ^[38]

- **Vacuum Properly:** A special vacuum is necessary for lead dust removal. High-Efficiency Particulate Air Filter (HEPA) vacuum should be used for cleaning. This vacuum has a filter that can collect the small pieces of lead that would otherwise be missed by a regular vacuum.
 - Cincinnati CLPPP facilitates a HEPA vacuum loan program where residents may borrow a HEPA vacuum up to six times a year for up to a week to clean lead dust. *Call (513) 357-7420 to learn more.*
- **Wet Washing:** Wet washing areas that lead dust may collect on (windowsills, walls, doors, etc.) can minimize your risk of inhalation.
- **Regular Cleaning:** Wash sheets and clothing in detergent regularly. Wash toys, pacifiers, bottles, stuffed animals, and anything a child can put in their mouth in dish-washing detergent or Tri-sodium Phosphate (TSP) and water solution.

4.) Personal Hygiene: Routine personal washing with soap after lead dust contact can reduce the risk of ingestion or inhalation of lead dust. Handwashing with warm, soapy water after floor or outdoor play can remove lead dust from hands that may be ingested from hand-to-mouth behavior. ^[33, 38]

5.) Adopt a Lead Conscious Diet: Parents can provide healthy dietary options for children that can protect them from harmful lead absorption. Make sure food is not exposed to lead by avoiding storing or serving food in pottery. By adopting the habits below, children can reduce their risk of the harmful effects of lead poisoning: ^[39, 40, 41]

- **Eat Regular Meals:** Lead is absorbed more easily on an empty stomach. Eating nutritional meals regularly will result in a decreased amount of lead absorbed.
- **Adopt a Low-Fat Diet:** Dietary fat increases lead absorption. Therefore, a low-fat diet helps decrease amount of lead absorbed. Aim for vegetables, poultry, and lean meats such as beef and chicken.
- **Eat Calcium Rich Foods:** The body mistakes lead for calcium and as a result will absorb lead when calcium is needed. Incorporate dairy products such as milk, yogurt, and cheese into daily meals.
- **Eat Iron Rich Foods:** Low iron levels make it easier for the body to absorb and store lead. High iron prevents this absorption. Eat foods such as red meat, beans, and dark leafy vegetables like spinach and kale.
- **Reduce Salt Intake:** Excessive amounts of salt in the body can cause rapid calcium loss. This deficiency can result in a greater absorption of lead in the body.
- **Switch to Water Instead of Soda:** Sugary drinks can lead to impaired gut function and further immune system concerns. Drinking water can aid in digestion and improve overall health outcomes.
- **Use the 1/2 Plate Rule:** The goal for each meal should be half a plate of fruits and vegetables. Grains and protein should be the other half of the plate.

CHILDHOOD LEAD PREVENTION PROGRAM

Ohio

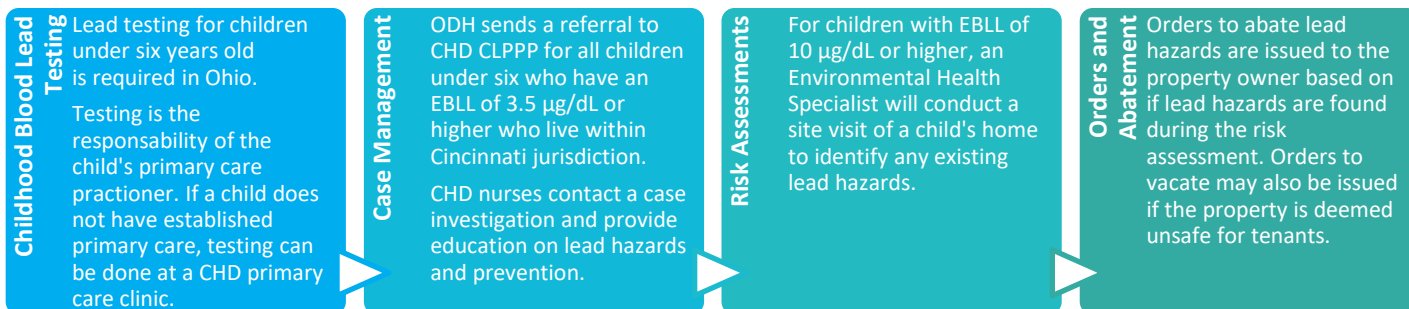
Ohio is ranked second nationally for the highest percentage (5.2%) of lead poisoned kids according to a 2021 study, far exceeding the national average of 1.9%. In response, ODH hosts The Ohio Health Homes and Lead Poisoning Prevention Program (OHHLPPP), a comprehensive statewide lead poisoning prevention program. The program offers guidelines on lead testing and medical management, educates healthcare providers, conducts surveillance, licenses professionals, and provides compliance assistance and monitoring through the statewide Healthy Housing and Lead Poisoning Surveillance System (HHLPPS), which includes a lead poisoning and testing database and risk assessment management system. [42, 43]

Cincinnati

In 2024, Hamilton County ranked 54th of Ohio's 88 counties for the highest percentage of lead-poisoned children according to OHD Blood Lead Testing Public Data. This represents a slight worsening from its 2023 rank of 55th. [1]

The Cincinnati Health Department Childhood Lead Poisoning Prevention Program (CHD CLPPP) received an average of 220 cases of children annually from 2015 to 2024 with elevated blood lead levels above corresponding reference level each year (2015-2020 = 5 µg/dL & 2021-present = 3.5 µg/dL); however, only 36.843% of Cincinnati children are being tested annually. This means that some children with EBLs are likely not identified, resulting in an under-reporting bias. CHD is working to improve testing rates through a blood lead testing quality improvement project within our primary care clinics. Currently, the CHD CLPPP provides case management to children referred with a lead level of 3.5 µg/dL and higher. Each family receives a home visit from a public health nurse providing assessment of the child, education to the family, and necessary referrals to other agencies. Children with lead levels of 10 µg/dL and above additionally receive an environmental risk assessment of their home, which includes testing of painted surfaces, dust, soil, and water. In 2024, 24 risk assessments were done. Board of Health orders are issued to the property owner to correct lead hazards. When owners do not comply, legal cases are filed in housing court to enforce the orders. [1]

Childhood Blood Lead Testing



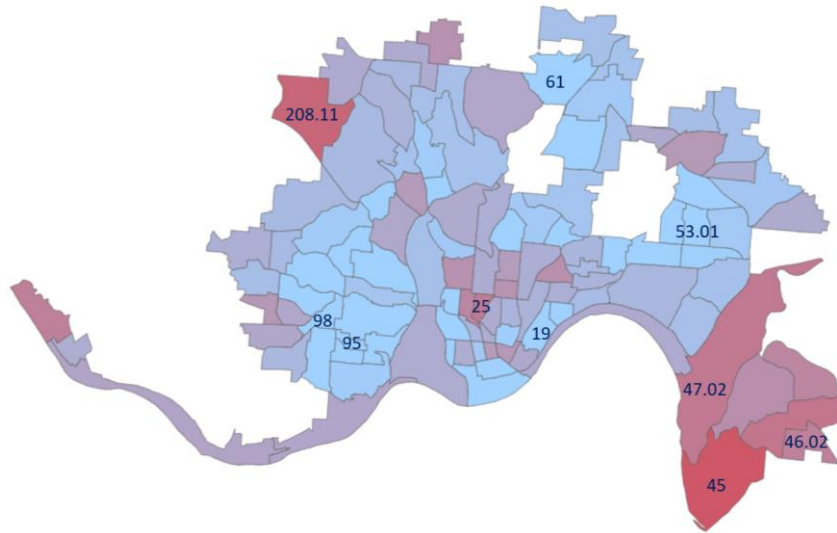
It is Ohio law that all children should be tested for lead per [Ohio Administrative Code 3701-30](#). The rule outlines that it is the primary health care provider's responsibility to test children under the age of six. All children between one and two years of age should be tested at annual check-ups. All children between the ages of three to six years of age with no BLL test history should receive a test. BLL testing is inexpensive and typically covered by health insurance. [2, 44]

Outside of regular testing, additional testing for children up to age six is warranted if any of the following are met:

- If the child is on Medicaid.
- If the child lives in a high-risk zip code. *All Cincinnati zip codes are considered high-risk.*
- If the child lives in or regularly visits a home, childcare facility, or school built before 1950.
- If the child lives in or regularly visits a home, childcare facility, or school built before 1978 that has deteriorated paint.
- If the child has a sibling or playmate who has or previously had lead poisoning.
- If the child has frequent contact with an adult who works with lead. e.g., construction, welding, pottery, painting.
- If the child lives near an active or former known lead environmental industrial hazard such as a lead smelter, battery recycling plant, or other industry known to generate airborne lead dust. [2, 44]

Percentage of Children Tested from 2015-2024 by Census Tract

Low Testing  High Testing



Census Tracts with the LOWEST Percentage of Children Tested

Census Tract	Rank	Neighborhood	Tested
45	118	California	7.53%
208.11	117	Mt. Airy	13.22%
46.02	116	Mt. Washington	18.07%
47.02	115	Sayler Park	20.45%
25	114	Mt. Washington	21.20%

Census Tracts with the HIGHEST Percentage of Children Tested

Census Tract	Rank	Neighborhood	Tested
95	1	East Price Hill	96.22%
53.01	2	Oakley	79.92%
19	3	Walnut Hills	73.63%
61	4	Carthage	72.49%
98	5	East Price Hill	68.19%

Figure 1: 2015-2024 Average percentage of children tested in Cincinnati by census tract. Average citywide venous blood lead testing from 2015-2024 for children under six is 36.843%. We do not see a correlation between population size and testing rates among census tracts.^[1]

Tests

There are two types of tests to detect lead in blood, capillary blood draw and venous blood draw. Capillary blood draw, also known as a finger or heel stick, is less invasive than venous tests because it requires a smaller amount of blood volume and can be performed quickly and easily.

Capillary testing is great for screening and creating a baseline for testing but *cannot confirm an EBLL*. Though it has many advantages, capillary testing has a greater risk of false results due to the small proportion of blood volume and possible lead contamination on the skin. Venous testing, though more accurate, can be more invasive because it draws blood from a vein such as in the inner elbow. In Ohio, as of 2023, all capillary tests that indicate EBLL need to be confirmed by a more accurate, venous blood draw.^[45]

Cincinnati Children Under 6 Tested by Year

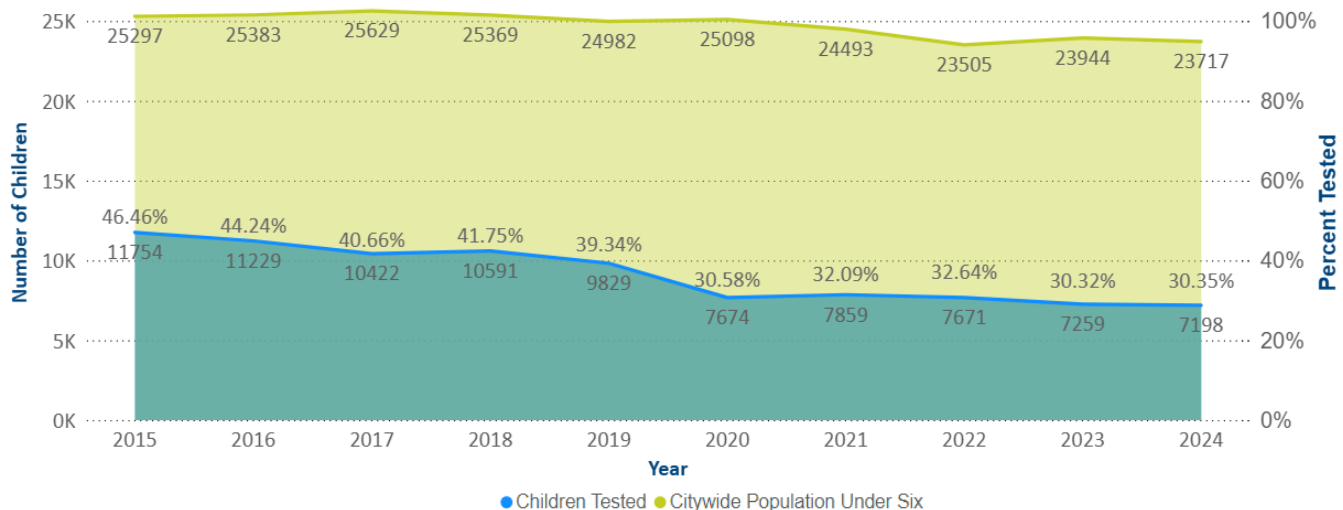
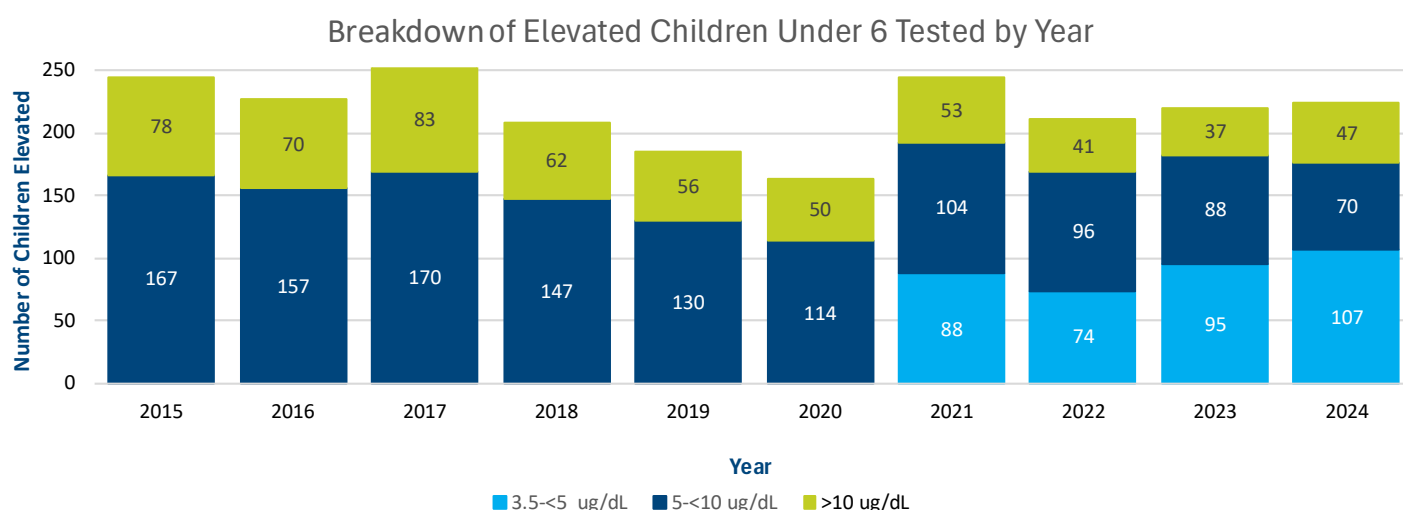


Figure 2: Since 2015, on average 36.843% of children in Cincinnati have been screened for lead using either a venous or capillary blood test. A significant decrease in testing is seen in 2020 suspected due to COVID-19. The estimated population under six is taken from the ACS table B09001, differing from annual reports prior to 2024 where the population was estimated using linear regression leading to a change in percent of population tested.^[1, 4]

Results

According to the CDC there is no safe level of lead. In 1991, the Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) defined EBLI greater than or equal to 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) as "a blood level of concern" that should prompt public health action. In 2012, that blood lead reference value (BLRV) was revised to reference children under six with EBLI in the 97.5 percentile by the National Health and Nutrition Examination Survey (NHANES). In 2012, the children with the highest 2.5 percentile of blood levels had EBLI at or above 5 $\mu\text{g}/\text{dL}$. In 2021, the NHANES determined that children with the highest 2.5 percentile EBLI had levels at or above 3.5 $\mu\text{g}/\text{dL}$. ODH implemented the change of threshold from 5 $\mu\text{g}/\text{dL}$ to 3.5 $\mu\text{g}/\text{dL}$ in 2023. The presented data uses the reference level of 5 $\mu\text{g}/\text{dL}$ since that was the reportable threshold at the time of testing for 2015 through 2022 and adds 3.5 $\mu\text{g}/\text{dL}$ as an additional category in 2023. Though state thresholds were not lowered until 2023, the Cincinnati Health Department proactively adopted the NHANES change, beginning case management of all elevated cases 3.5 $\mu\text{g}/\text{dL}$ and above upon the NHANES change in 2021.^[3]

CHILDREN WITH CONFIRMED ELEVATED BLOOD LEAD LEVELS

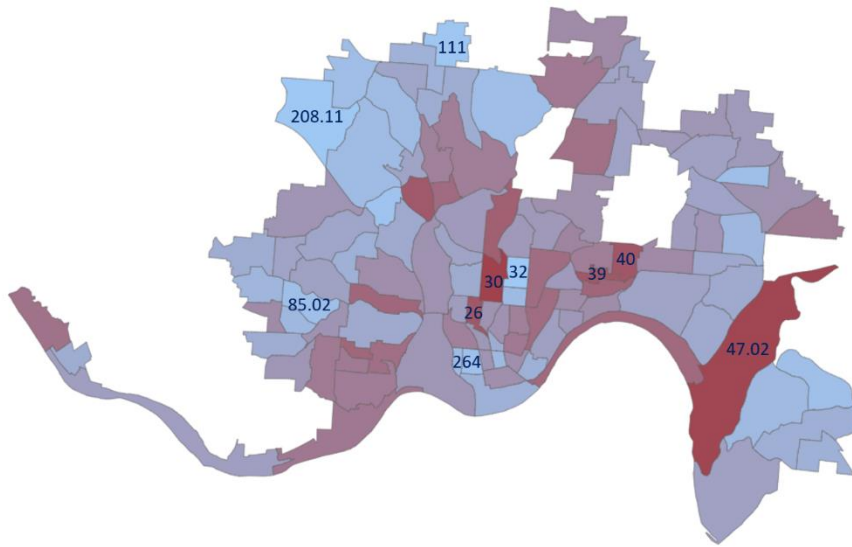


Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Mean ($\mu\text{g}/\text{dL}$)	13.19	11.87	12.13	11.33	11.04	14.67	11.73	11.65	12.36	11.66
Median ($\mu\text{g}/\text{dL}$)	10.10	9.10	9.70	9.10	9.05	9.20	8.90	7.85	8.05	8.80
Maximum ($\mu\text{g}/\text{dL}$)	104.6	52.7	53.0	56.0	55.7	108.8	51.2	73.0	92.5	46.0
Prevalence (%)	4.2%	3.8%	3.8%	3.3%	3.2%	3.6%	3.0%	3.3%	3.0%	3.0%

Figure 3: On average, 3.42% of all Cincinnati children who received a confirmatory BLL test (venous) had EBLI from 2015 to 2024. In 2024, 3.0% of all Cincinnati children tested had an EBLI at or above 3.5 $\mu\text{g}/\text{dL}$. The prevalence of elevated cases is stable and the variability between years does not indicate a significant change. Note the change of threshold adopted by ODH in for 2023, though CHD adopted NHANES guidance in 2021.^[1]

Percentage of Confirmed Elevated Children from 2015-2024 by Census Tract

High Percentage Elevated Low Percentage Elevated



Census Tracts with the **HIGHEST** Percentage of Children Elevated

Census Tract	Rank	Neighborhood	Elevated
30	118	CUF	10.91%
47.02	117	Linwood	10.57%
40	116	Evanston	9.34%
39	115	Evanston	9.21%
26	114	CUF	9.20%

Census Tracts with the **LOWEST** Percentage of Children Elevated

Census Tract	Rank	Neighborhood	Elevated
32	1	Corryville	0.64%
208.11	2	Mt. Airy	0.66%
111	3	College Hill	0.78%
85.02	4	Roll Hill	1.00%
264	5	West End	1.25%

Figure 5: 2015-2024 Average prevalence of elevated children in Cincinnati by census tracts (confirmatory venous testing). Average citywide elevated prevalence from 2015-2024 is 3.42% of all tested children. ^[1]

Breakdown of Confirmed Elevated Children from 2015-2024 by Age & Sex

	UNDER 1 YEAR	1 YEAR	2 YEARS	3 YEARS	4 YEARS	5 YEARS	TOTAL
Male	82	666	397	196	127	91	1559
Female	90	593	328	138	102	58	1309
Unknown	2	4	1	0	0	2	9
Total	174	1263	726	334	229	151	2877

Table 1: Average age for an elevated case in Cincinnati from 2015-2024 is 1.87 years (22.4 months). Significantly more males had elevated tests from 2015-2024 compared to females. $\alpha=0.05$; $z=4.47$ ^[1]

Percentage of Confirmed Elevated Children from 2015-2024 by Race & Ethnicity

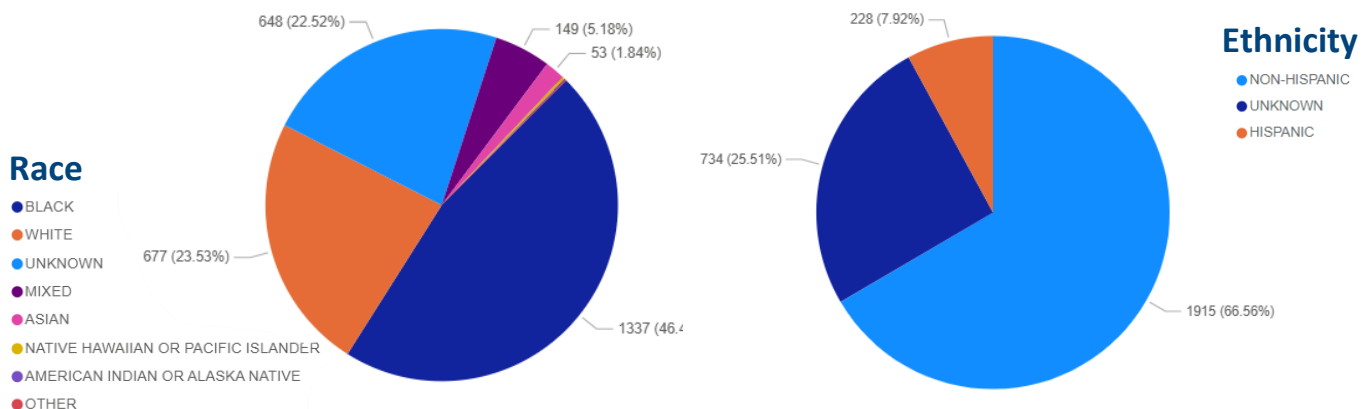


Figure 6: Black children accounted for 46.47% of all elevated cases from 2015-2024, though 22.52% of elevated cases do not have a race reported. 66.56% of elevated cases occurred in children who identified as non-Hispanic. ^[1]

Risk Assessments

In 2024, the CLPPP team performed 24 risk assessments in homes of children with EBLI at or above 10 µg/dL. Multiple children residing in a single unit (siblings), children who moved from the suspected lead hazardous property (no access), and children tested at the end of the calendar year resulting in a risk assessment performed after January 1, 2025, account for the discrepancy between cases above 10 µg/dL (n=47) and number of risk assessments performed. All 24 risk assessments were analyzed to identify common hazards specific to Cincinnati. Hazards such as lead paint and lead dust were present in most homes. Risk assessments test for lead paint, lead dust, and lead traces found in soil and water.

Possible Lead Hazards from 2024 Risk Assessments (n=24)

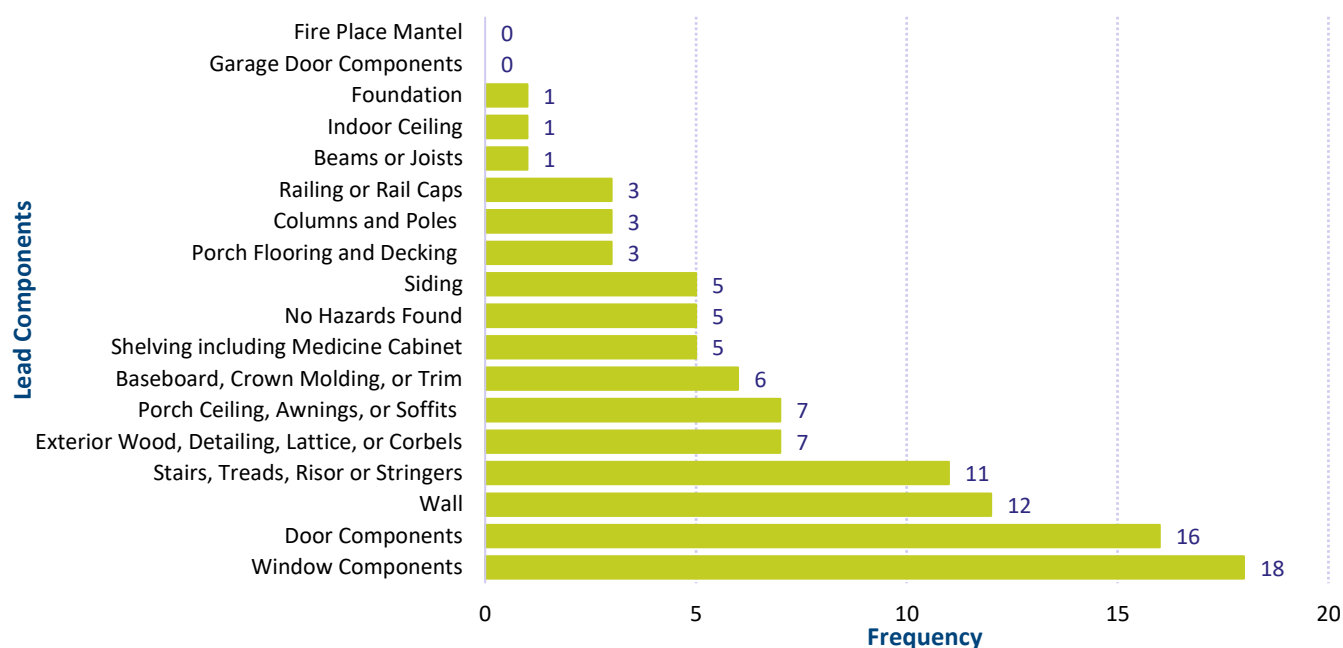


Figure 7: Lead based paint is regularly found primarily in the paint of doors and windows, though it is present in many other locations in the home. Five properties had no lead hazards found, meaning that the lead exposure had to have come from another location.

Breakdown of Lead Sample Findings from 2024 Risk Assessments (n=24)

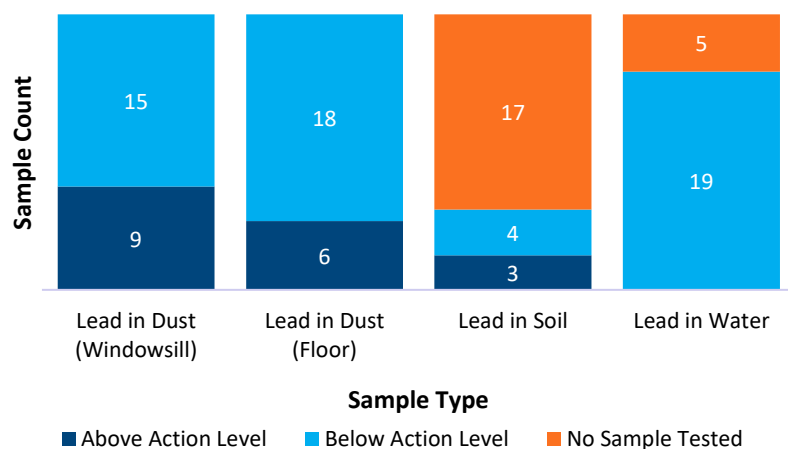


Figure 8: Dust samples from windowsills and floors are the most likely sample type to find lead particles and require immediate remediation efforts. No water samples found actionable levels of lead.

When lead paint peels or cracks, it makes lead chips and dust that can be found in areas of high friction or rubbing such as windowsills and doorways or could accumulate in the soil. During risk assessments, CHD takes dust and soil samples and tests them for lead. Water samples are taken and sent to GCWW to test for lead.

Each sample has a threshold, referred to as an action level at which immediate action to remove the lead hazard is required.

- Soil Sample in play area ≥ 400 µg/g
- Water Sample ≥ 15 µg/L
- Dust Sample, Floors ≥ 10 µg/ft²
- Dust Sample, Windowsills ≥ 100 µg/ft²

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MISSION:

To provide comprehensive, culturally competent, and quality health care for all.

VISION:

To create a healthier community by serving one patient at a time.