2021

Lead Report

city of CINCINNATI HEALTH DEPARTMENT

SEPTEMBER 19, 2022

City of Cincinnati Health Department
Environmental Health
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ABOUT THIS REPORT

This report is intended provide information about the Cincinnati Health Department's Childhood Lead Poisoning Prevention Program to the public and local policy makers. The purpose is to provide information about lead 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.

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DATA PARAMETERS

The data analyzed in this report is taken from the Ohio Department of Health (ODH) Healthy Homes and Lead Poisoning Prevention Program Lead Data warehouse. Cases are identified as the highest recorded test per patient Identification (PATIENT_ID) per calendar year (BEST_TEST_FOR_CY). Data is limited to cases within Cincinnati City jurisdiction (PATIENT_CITY= CINCINNATI) and the 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 exposures can occur outside the home. [1]

Though the national guideline on lead threshold has changed to 3.5 µg/dL, as of September 2022, the details of implementing the change have not yet been adopted by ODH. The data presented in this report uses the reference level of 5 µg/dL, since that was the reportable threshold at the time of testing. Data from 2021 is provisional and subject to change.

The population data is taken from the 2010 census and has been extrapolated from 2000 census data to get estimated population over time using a linear regression. 2020 census data at local levels has not been released as of September 2022. Maps are based on 2010 population distribution by age and census tract, because of the small population of children under six in each census tract the margin of error can be large.

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 through five with EBLL 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 EBLL):** The concentration of lead in the blood at a rate greater than or equal to 5 µg/dL by venous blood draw.
- **Elevated Blood Lead Levels (EBLL):** The concentration of lead in the blood at a rate greater than or equal to 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 5 µg/dL or greater.
- **Lead-Contaminated Housing:** Housing that is deemed unsafe due to in home containing lead hazards such as contaminated water or deteriorating lead-based paint.
- **Lead Dust:** surface dust contaminated with or contains mass concentrations of lead.
- **Micrograms per Deciliter (µg/dL):** How much mass of a contaminant (lead) exists in a deciliter of liquid (blood).
- **Maximum Contaminant Level (MCL):** legal threshold limit on the amount of substance that is allowed in the public water systems under Safe Drinking Water Act.
- **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

7900 Children tested for lead in Cincinnati in 2021

238 Children with confirmed blood lead levels of 5 µg/dL or greater. This was 3.0% of the total tested in 2021

69 Children with confirmed blood lead levels of 10 µg/dL or greater. This was 0.8% of the total tested in 2021

48 properties had risk assessments proformed in 2021

ABOUT LEAD

Where is Lead Found in Cincinnati

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 in the form of lead carbonite and lead oxides, were added to paint due to its excellent adhesion, drying, pigmenting, and covering abilities. Lead-based paint was used extensively before 1960 because it was more vibrant and durable than other paints of the time. From the 1700s to the early 1900s most wooden trims and woodwork, high gloss surfaces, wood toys, and metals were primed or painted with lead-based paints. Lead-based paint for housing was banned by the United States Consumer Product Safety Commission in 1978, yet lead-contaminated housing remains a significant public health problem. At least 29 million lead-contaminated homes remain in the United States today. In 2018, ODH estimated that roughly 84% of Cincinnati's housing stock was built prior to 1978, meaning roughly 136,000 homes could have deteriorating lead-based paint. 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. [2, 3]

Water Pipes

Lead water service lines were the primary infrastructure for water distribution in cities beginning in the U.S. in the late 1800s. Lead pipes were chosen over cheaper materials, like iron, due to their increased longevity and malleable nature. Deteriorating or corroding lead pipes, brass or chrome-plated faucets, galvanized iron pipes or other plumbing soldered with lead can leach lead into drinking water that cannot be seen, smelled, or tasted. As the link between lead pipes and severe illness was observed, local officials began restricting or prohibiting the use of lead pipes by the 1920s. Cincinnati stopped installing lead in its service lines in 1927 and has spent the last 60 years replacing deteriorating lead pipes across the city. Despite these efforts, Ohio still ranks second in the country for the most lead service lines that still need to be replaced according to an Environmental Defense Fund Study done in 2016. According to GCWW, nearly 35,000 residential lead service lines still exist. In December of 2021, Cincinnati City Council voted to cover all costs of replacing residential lead service lines. If interested in determining whether a waterline includes lead pipes, please see GCWW lead map. Cincinnati residents can receive free water test kits from Greater Cincinnati Water Works (GCWW). [4, 5, 6]

Gasoline Additives

Lead was first used in gasoline as an anti-knock additive in 1921 in the form of Tetraethyl lead ($Pb(C_2H_5)_4$) to ensure fuel could burn more effectively within the engine. 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 27th, 2011, the United Nations Environmental Program (UNEP) announced a global eradication of leaded gasoline for cars and trucks by 2013. However, leaded gasoline is still used in automobiles in 6 nations: Afghanistan, Algeria, Iraq, North Korea, Myanmar, and Yemen. Tetraethyl lead is still used in leaded aviation gasoline also referred to as avgas. Though the Federal Aviation Administration (FAA) has enforced improved emission standards over the past 30 years, there are still recommendations to replace avgas. In a 2019 report, approximately 167,000 aircraft in the U.S., and a total of 230,000 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. [7, 8, 9, 10, 11]

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 then distribute throughout the body by digestion. Waterfowl and terrestrial game birds that have gizzards for grinding up their food, are at risk of being poisoned by spent 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 your health and the health of the environment by introducing lead into the food chain. [12, 13, 14, 15]

Cultural Items and Cosmetics

The U.S. has strict safety standards that screen products for heavy metals prior to distribution. Though unregulated products can often still be imported from Mexico, India, Asia, the Middle East, or 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. If there is question on the safety of a product. [16, 17]

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 is 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 Hindu and some 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. [16, 17]

Jewelry

Lead is used to make jewelry heavier, brighter, and more stable. Lead is often found in antique or plastic jewelry. Though lead jewelry is often considered safe for adults to wear and handle, 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 jewelry items. [18]

Lead in Soil and the Environment

Lead can be naturally occurring 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. [19]

Pesticides

Chemicals such as organophosphorus pesticides (e.g., tebufenozide, chromafenozide 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 supply 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. [20, 21]

Exposures

Childhood lead poisoning is the number one environmental disease in children that is entirely preventable. According to the 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 is often insidious, developing gradually as to be well established before becoming apparent. [22, 23]

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. [23, 24, 25, 26]

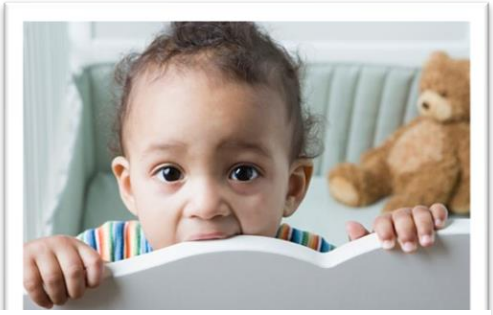


Image 1 Baby engaging in object-to-mouth behavior

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 things lead dust or paint chips may settle on. This includes hands, fingers, toys, or surfaces which can result in unintended ingestion of particles. [23, 26]

Image 2 Baby engaging in hand-to-mouth behavior

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, ship burning, 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. [26, 27, 28]

Effects of Lead Exposures

Children younger than 6 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. [23, 24, 25]

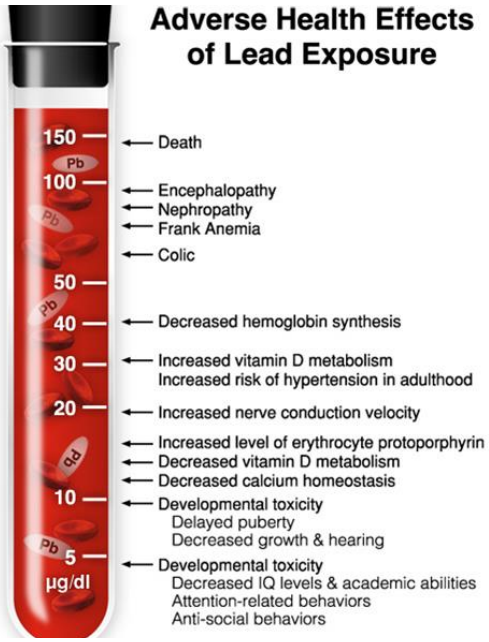


Figure 1 Taken from Adair County (MO) Health Department. Outlines at what level of lead per deciliter of blood adverse health effects can occur. There is no safe level of lead in the blood.

In adults lead poisoning can be dangerous. EBLL of lead 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 in males. [24, 25]

Pregnant females 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. [24, 25]

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 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. [26, 27, 28]

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. [24, 25 26]

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. [3, 27, 28]

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. [3, 28]

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: [27, 29, 30]

- *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.
- *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. [24, 29, 30]

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: [31, 32, 33, 34, 35]

- *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, lean meats, and poultry 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 makes 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

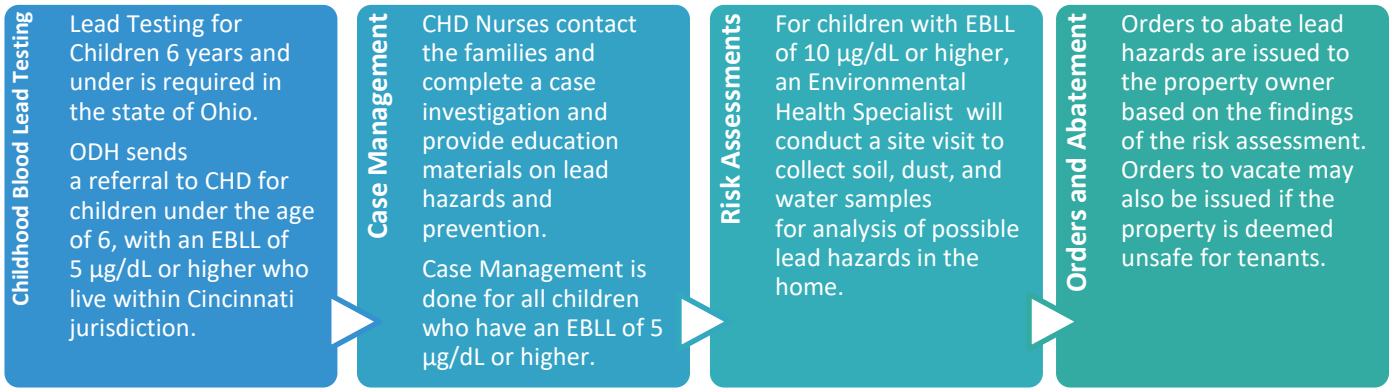
Ohio

Ohio is ranked 2nd nationally for the highest percent (5.2%) of lead poisoned kids according to a 2021 study, far exceeding the national average of 1.9%. In response, ODH hosts a comprehensive statewide lead poisoning prevention program overseen by the Ohio Lead Advisory Council (OLAC) that provides advice regarding the policies and procedures of the program. The program provides guidelines on lead testing and medical management, educated healthcare providers, conducts surveillance, licenses the professional workforce, and provides compliance assistance and monitoring via a statewide lead poisoning and testing database. [36]

Cincinnati

In 2017, out of 88 counties, Hamilton County ranks 16th (1.0%) in Ohio for the highest percent of kids with EBLL. In the same year, 3.8% of children in the City of Cincinnati tested had EBLL. This means a large proportion of Hamilton county's lead poison kids reside withing city limits. The Cincinnati Health Department Childhood Lead Poisoning Prevention Program (CHD CLPPP) receives an average of 356 cases of children per year since 2015 with lead levels above the reference level (5 µg/dL); however, only 42.8% of Cincinnati children are being tested annually. This means that some children with EBLLs are likely not identified, resulting in an under-reporting bias. [1, 37]

Currently, the CHD CLPPP provides case management to all children referred with a lead level of 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. In 2021, 117 children got case management services form CHD CLPPP. Children with lead levels of 10 µg/dL and above, averaging 93 children per year since 2015, receive an environmental risk assessment of their home which includes testing of painted surfaces, dust, soil, and water. In 2021, 48 risk assessments were done. Multiple children per home and declining a risk assessment account for the discrepancy between cases above 10 µg/dL and number of risk assessments preformed. 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]

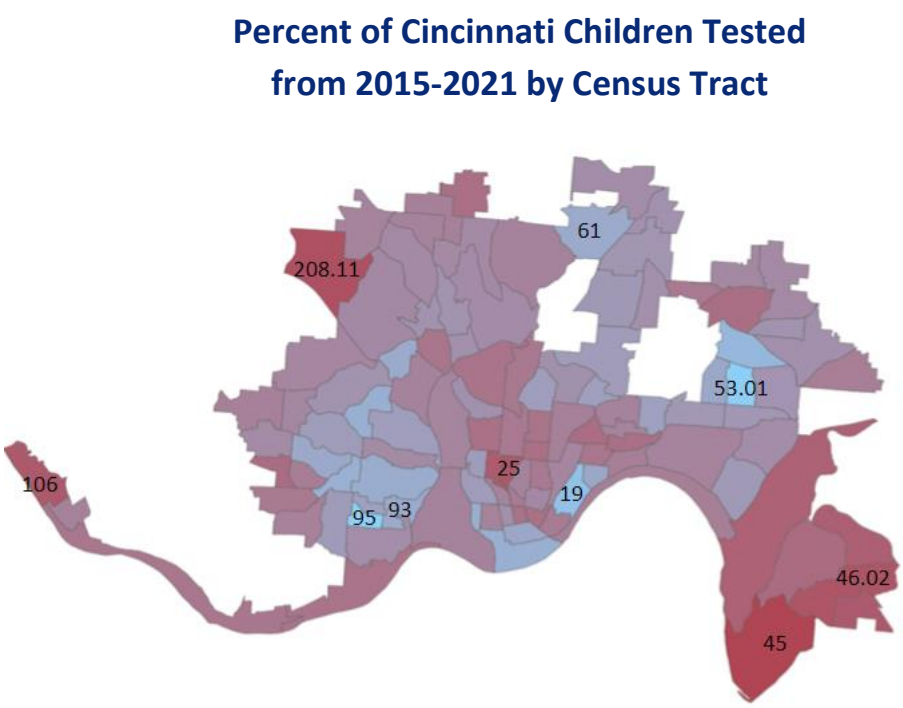


Childhood Blood Lead Testing

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. [38, 39]

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 Hamilton County 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 that 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. [38, 39]



Census Tracts with the **LOWEST** Percent of Children Tested			
Census Tract	Rank	Neighborhood	Tested
45	*118*	*California*	5.97%
208.11	*117*	*Mt. Airy*	10.43%
46.02	*116*	*Mt. Washington*	11.91%
25	*115*	*CUF*	13.21%
106	*114*	*Sayler Park*	13.70%

Census Tracts with the **HIGHEST** Percent of Children Tested			
Census Tract	Rank	Neighborhood	Tested
95	*1*	*East Price Hill*	67.65%
53.01	*2*	*Oakley*	57.53%
19	*3*	*Walnut Hills*	55.31%
93	*4*	*East Price Hill*	50.71%
61	*5*	*Carthage*	49.69%

Figure 2: 2015-2021: Average percent of children tested in Cincinnati by Census Tracts. Average citywide testing from 2015-2021 is 42.8% [1]

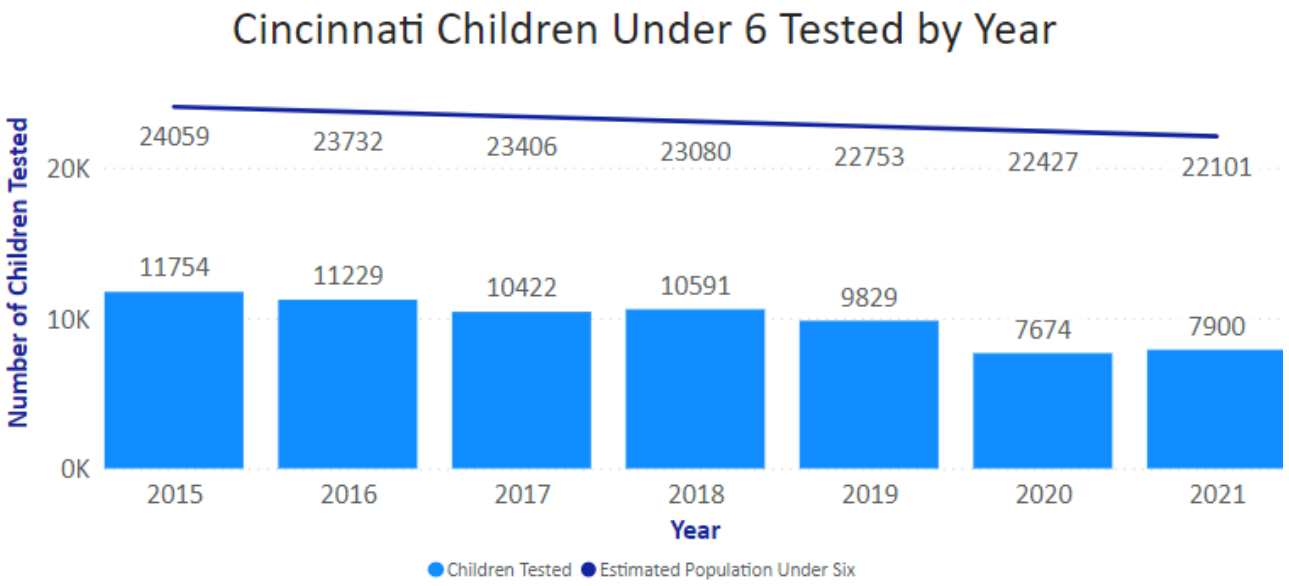


Figure 3: Since 2015, on average 42.8% of children in Cincinnati have been tested for lead. 2015, 48.85%; 2016, 47.32%; 2017, 44.53%; 2018, 45.89%; 2019, 43.20%; 2020, 34.22%; 2021, 35.74%. A significant decrease in testing is seen in 2020 suspected due to COVID-19. α=0.05* Comparative Error (c) = 1.96 * √ (43.2(100-43.2) ÷ 22753) + (34.2(100-34.2) ÷ 22427) = 0.894295, Difference= 9.00 (8.894295< 9.00). The estimated population under six is a linear regression of population from 2000-2010. [1]

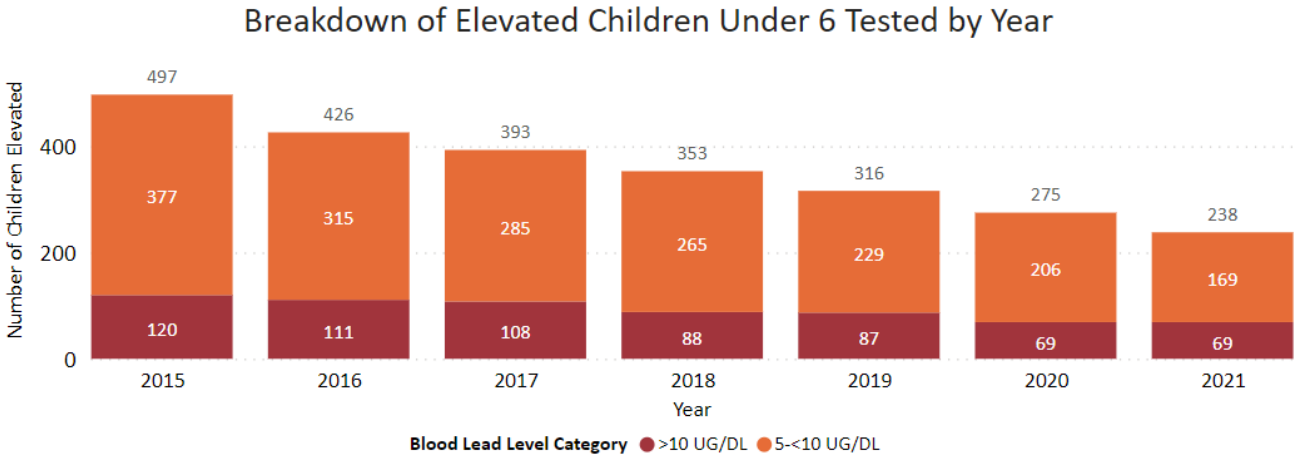
Tests

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. In Ohio, as of 2022, all capillary tests that indicate EBLL need to be confirmed by a more accurate, venous blood draw. [40]

Results

According to the Centers for Disease Control and Prevention (CDC) there is no safe level of lead. In 1991, the Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) defined EBLL greater than or equal to 10 micrograms per deciliter (µg/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 EBLL 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 EBLL at or above 5 µg/dL. In 2021, the NHANES determined that children with the highest 2.5 percentile EBLL had levels at or above 3.5 µg/dL. ODH has not implemented the change of threshold from 5 µg/dL to 3.5 µg/dL as of September 2022. The presented data uses the reference level of 5 µg/dL since that was the reportable threshold at the time of testing. [41]

CHILDREN WITH ELEVATED BLOOD LEAD LEVELS



YEAR	2015	2016	2017	2018	2019	2020	2021
MEAN	9.1 µg/dL	9.1 µg/dL	9.1 µg/dL	9.0 µg/dL	8.8 µg/dL	9.8 µg/dL	10.1 µg/dL
MEDIAN	7.0 µg/dL	7.0 µg/dL	7.0 µg/dL	7.0 µg/dL	7.0 µg/dL	6.6 µg/dL	7.5 µg/dL
MAXIMUM	104.6 µg/dL	52.7 µg/dL	53.0 µg/dL	56.0 µg/dL	55.7 µg/dL	108.8 µg/dL	51.2 µg/dL
PREVELANCE	4.2%	3.8%	3.8%	3.3%	3.2%	3.6%	3.0%

Figure 4: On average, 3.6% of all Cincinnati children who received a BLL test had EBLL from 2015 to 2021. In 2021, 3.0% of all Cincinnati children tested had an EBLL at or above 5 µg/dL. The prevelance of elevated cases is stable and the variablity between years does not indicate a significant change.[1]

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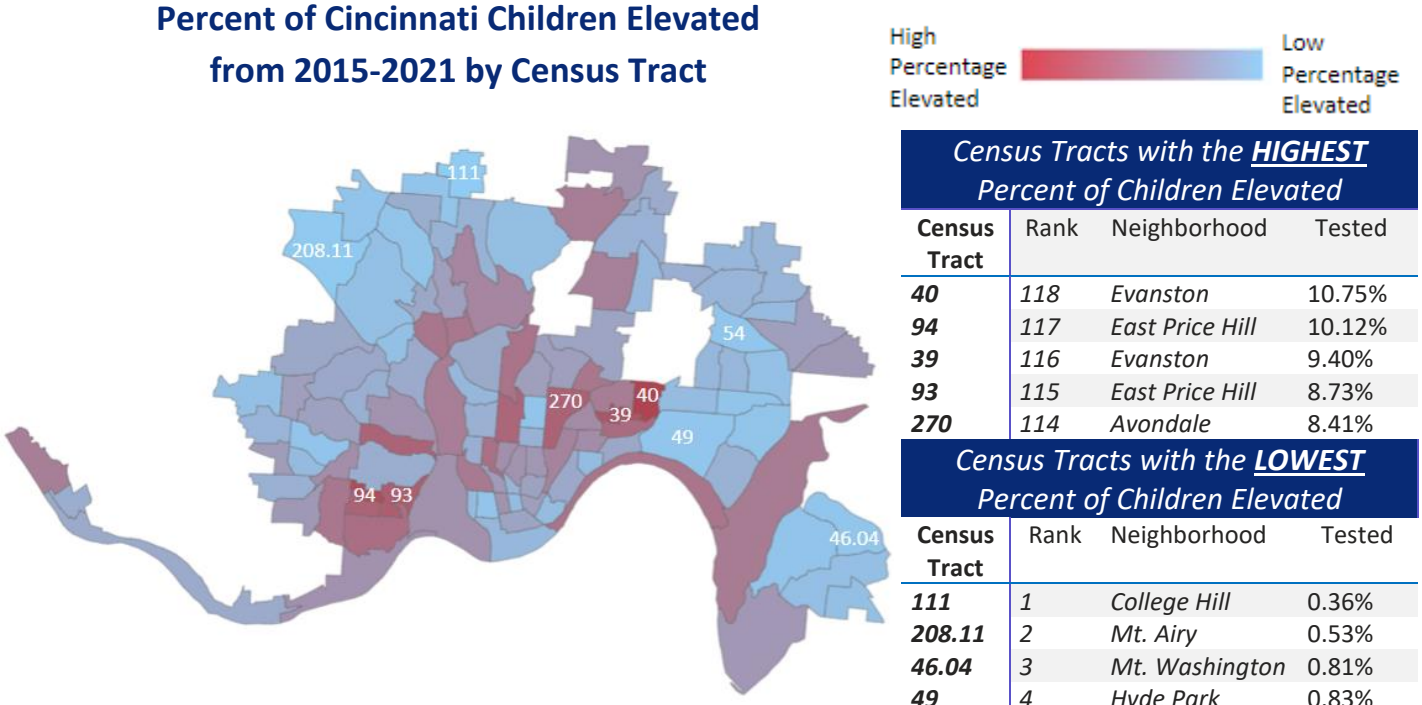
Percent of Cincinnati Children Elevated from 2015-2021 by Census Tract



*Census Tracts with the **HIGHEST** Percent of Children Elevated*			
Census Tract	Rank	Neighborhood	Tested
40	*118*	*Evanston*	10.75%
94	*117*	*East Price Hill*	10.12%
39	*116*	*Evanston*	9.40%
93	*115*	*East Price Hill*	8.73%
270	*114*	*Avondale*	8.41%

*Census Tracts with the **LOWEST** Percent of Children Elevated*			
Census Tract	Rank	Neighborhood	Tested
111	*1*	*College Hill*	0.36%
208.11	*2*	*Mt. Airy*	0.53%
46.04	*3*	*Mt. Washington*	0.81%
49	*4*	*Hyde Park*	0.83%
54	*5*	*Oakley*	0.85%

Figure 5: 2015-2021: Average percent of children elevated in Cincinnati by Census Tracts. Average citywide elevation from 2015-2021 is 3.6% [1]

BREAKDOWN OF ELEVATED CHILDREN (2015-2021) BY AGE AND SEX							
	UNDER 1 YEAR	1 YEAR	2 YEARS	3 YEARS	4 YEARS	5 YEARS	**TOTAL**
Male	54	502	352	182	143	105	**1338**
Female	62	459	281	162	127	58	**1149**
Unknown	3	3	2	1	0	1	**10**

Table 1: Average age for elevated case in Cincinnati in from 2015-2021 is 2.07 years (25 months). Significantly more males had elevated tests form 2015-2021 compared to females. α=0.05* Comparative Error (c) = 1.96 * √ (53.58(100-53.58) ÷ 2497) + (46.02(100-46.0) ÷ 2497) = 2.77, Difference= 7.57 (2.77< 7.57). [1]

Percent of Cincinnati Children Elevated from 2015-2021 by Race and Ethnicity

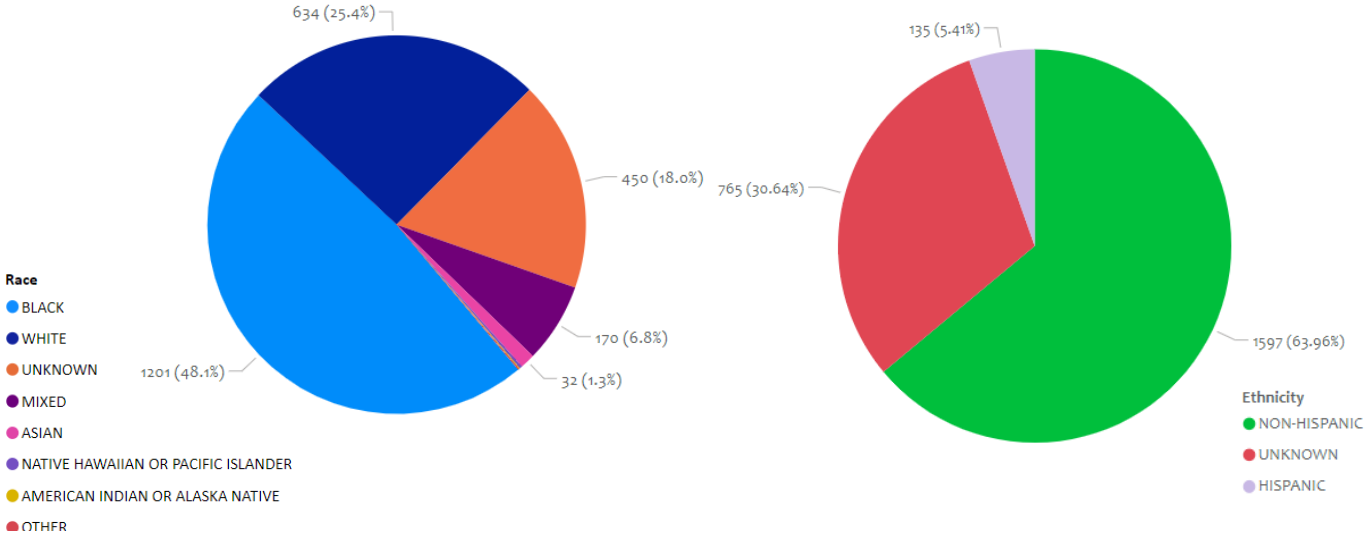


Figure 6: Black children accounted for 48.1% of all elevated cases from 2015-2021. XX occurred in children who identified as non-Hispanic. [1]

Risk Assessments

In 2021, the CLPPP team preformed 48 risk assessments in homes of children with EBLL at or above 10 µg/dL. Based on the small number a cohort of 30 risk assessments from 2020-2021 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.

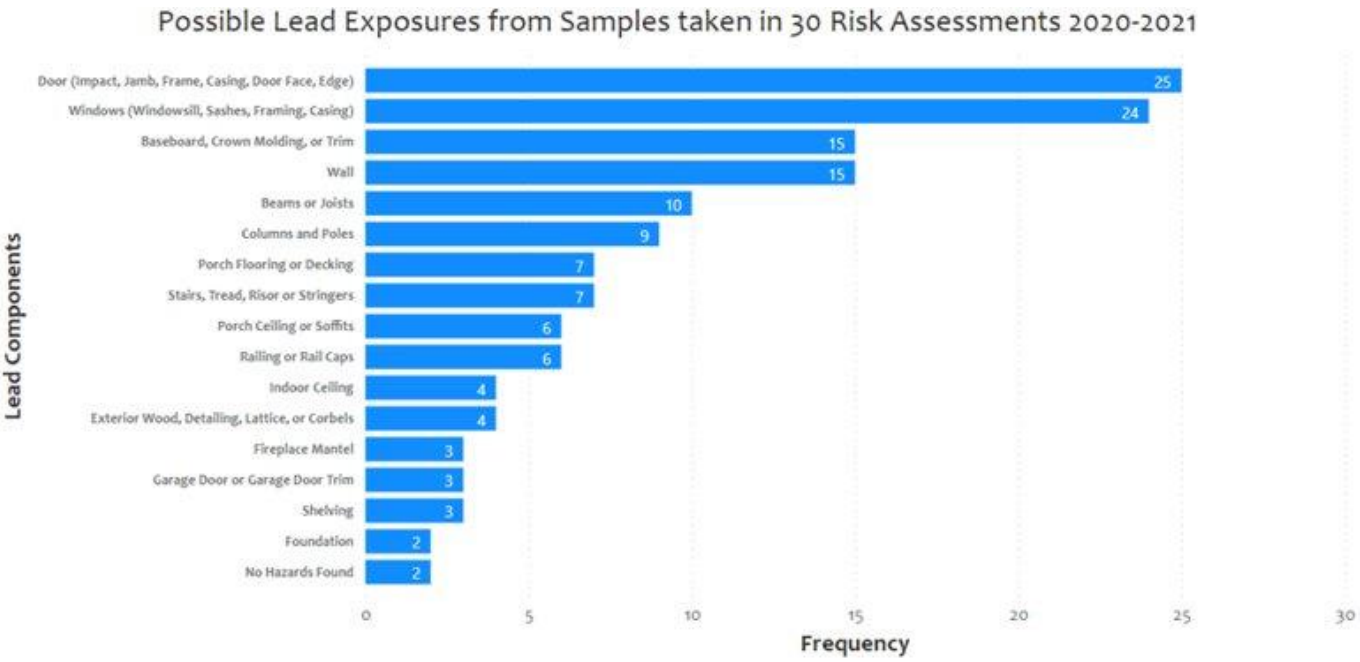
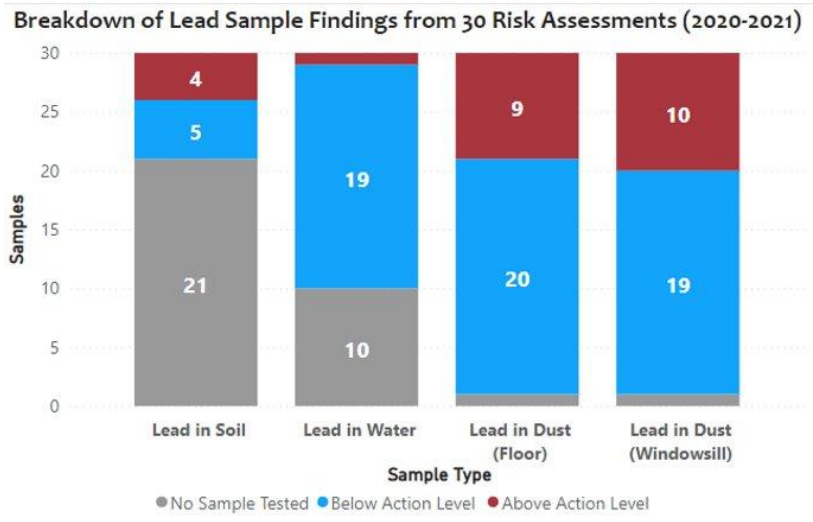


Figure 5 Lead based paint is regularly found primarily in the paint of doors and windows, though it is present in many other locations in the home. 2 properties had no lead hazards found meaning that the lead exposure had to have come from another location.



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/ft^2
- Dust Sample, Windowsills ≥ 100 µg/ft^2

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