

2022 Childhood Lead Surveillance Annual Report



pennsylvania
DEPARTMENT OF HEALTH

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Executive Summary

This is the Pennsylvania Department of Health's (Department) 17th childhood lead surveillance annual report, covering data for children tested in Pennsylvania (PA) during the calendar year 2022. Data were extracted from the Department's electronic reportable disease surveillance system, the PA National Electronic Disease Surveillance System (PA-NEDSS). This report is provided as a source of information for the public; federal, state, and local agencies; health care providers; and other organizations and individuals interested in lead poisoning prevention in PA. The report provides information about lead testing for children under the ages of 2 and 6 by confirmation status; method of testing; method of reporting; county of residence; municipality; race and ethnicity; and residence in a rural county or an urban county.

Exposure to lead, even at low levels, can cause intellectual, behavioral, and academic deficits.^{1,2} For this reason, in 2012, the Centers for Disease Control and Prevention (CDC) defined an elevated blood lead level (EBLL) as a blood lead level (BLL) ≥ 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$).³ Based on more recent data, on October 28, 2021, CDC updated the blood lead reference value (BLRV) from 5.0 $\mu\text{g}/\text{dL}$ to 3.5 $\mu\text{g}/\text{dL}$.⁴ This value is also used to identify children who require case management. This change from the BLRV of 5 $\mu\text{g}/\text{dL}$ to 3.5 $\mu\text{g}/\text{dL}$ was implemented in Pennsylvania on January 1, 2022. The category of confirmed between 3.5– < 5 $\mu\text{g}/\text{dL}$ was added to this report for 2022.

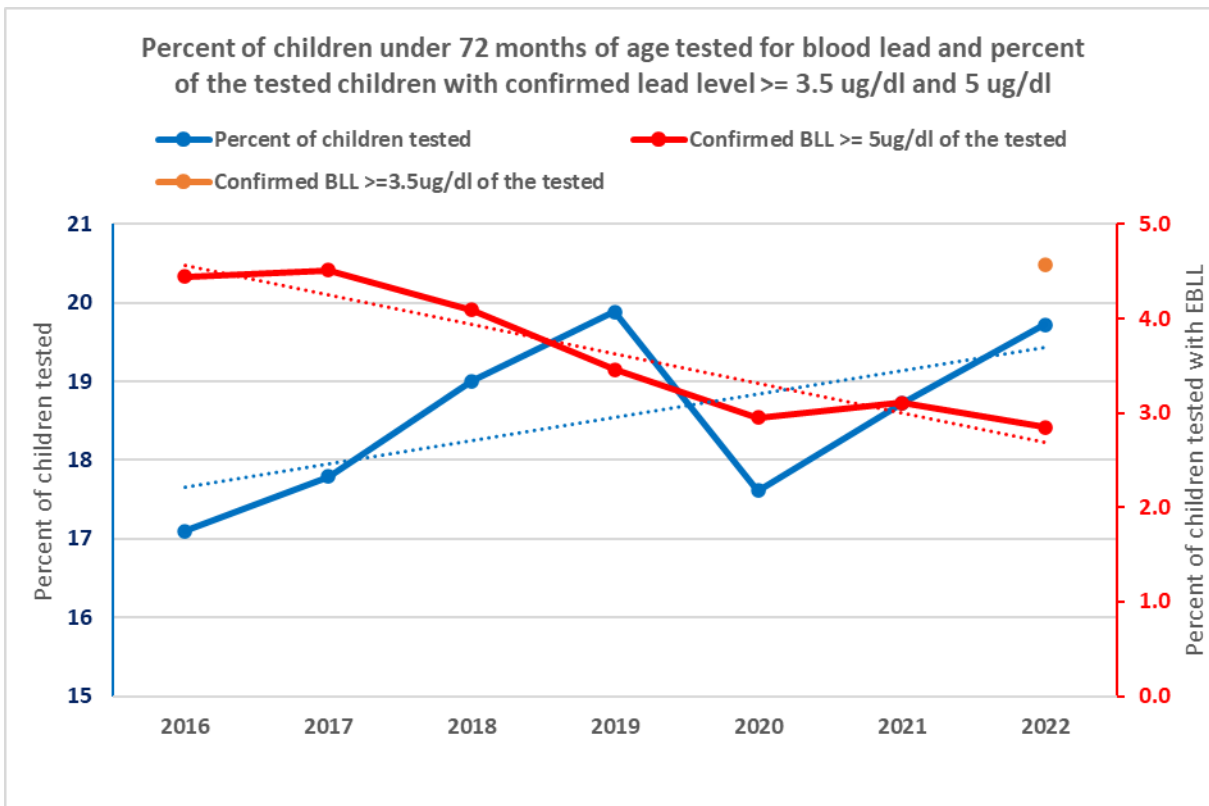
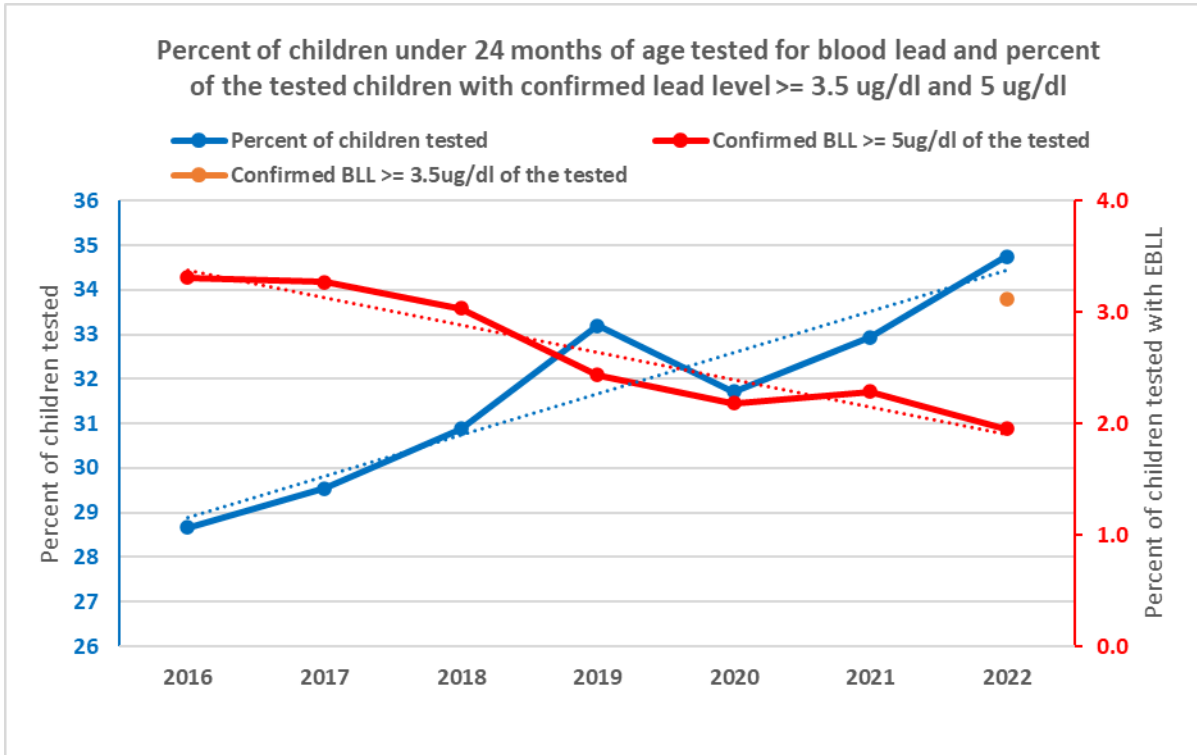
This report will be used by the Department to:

- identify areas that may be at high risk for lead exposure;
- locate areas of potential under-testing;
- make data available for state and local needs assessments; and
- Inform the work of federal agencies, hospitals, universities, providers, and county/municipal health departments.

The Department received 182,790 unique blood lead tests for 167,521 children ages 0-15 years in 2022. There were 8,971 children aged 0-15 years with an initial capillary test ≥ 3.5 $\mu\text{g}/\text{dL}$. Of those, 4,695 (52.3%) were retested appropriately, either with a venous test or another capillary blood lead test drawn within 84 days (12 weeks). Prior to 2022, children required a retest after an initial capillary test ≥ 5 $\mu\text{g}/\text{dL}$. There were 90,886 children (34.75% of the population) under age 2 years tested and 160,177 (19.72% of the population) children under age 6 years tested in 2022. There were 2,834 children under the age of 2 years (3.12% of those tested and 1.08% of the population) with a confirmed EBLL ≥ 3.5 $\mu\text{g}/\text{dL}$. There were 7,332 children under the age of 6 years (4.57% of those tested and 0.9% of the population) with a confirmed EBLL ≥ 3.5 $\mu\text{g}/\text{dL}$.

Overall testing and EBLL trends for children under 24 months and 72 months

- The percent of children tested increased annually since 2016, except for the decrease in 2020 due to the COVID-19 pandemic.
- The percent of children with a confirmed EBLL >5 $\mu\text{g}/\text{dL}$ decreased annually since 2016 except for a slight increase in 2021.



Over 40% of children did not have race or ethnicity information provided in their blood lead testing results. We increased the percentage of available race and ethnicity data to almost 90% by matching children's blood lead testing data to 2016-2022 birth certificate data and using the race/ethnicity information from their birth certificates. Among those children 0-23 months of age, testing rates for non-Hispanic Black or African American children and non-Hispanic Asian children were higher statewide than for Hispanic and non-Hispanic White children (38.72% and 36.30% versus 29.58% and 32.31%, respectively). Non-Hispanic Black or African American and Hispanic children had higher percentages of EBLLs of 3.5-9.9 µg/dL than non-Hispanic White children (3.88% and 3.83% versus 2.00%, respectively) among those tested. Percentages of test results ≥ 10 µg/dL were also higher among non-Hispanic Black or African American and Hispanic children than for non-Hispanic White children (0.75% and 0.93% versus 0.43%, respectively). Non-Hispanic Black or African American and Hispanic children also had higher percentages of unconfirmed elevated results among those tested than non-Hispanic White children, indicating gaps in appropriate follow-up among these populations. These same relationships were seen for children ages 0-71 months.

This report also includes testing and EBLL data for the 10 municipalities in PA with the highest number of children under 6 years of age, as well as two other cities with an Act 315 municipal health department. These included Philadelphia, Pittsburgh, Allentown, Reading, Erie (city), Upper Darby Township, Harrisburg, Scranton, Lancaster, York City, Bethlehem, and Wilkes-Barre. Testing rates and percentages of children with EBLLs among major municipalities/cities were generally higher than for their respective counties for both children under the age of 2 and under the age of 6. This finding may highlight the historical burden of older housing stock in PA municipalities/cities.

- Pittsburgh had the highest (46.43%) and the city of Bethlehem had the lowest (29.25%) lead testing rate for children 0-23 months old among major municipalities. The higher testing rate in Pittsburgh could be because Allegheny County started mandatory blood lead testing for children between 9 and 12 months and at 24 months in 2018.
- The percentage of EBLL ≥ 3.5 µg/dL of those tested under age 2 was highest in the cities of Reading (12.29%), York (11.48%), and Lancaster (8.14%).

Nationally, among states with older housing stock, lead-based paint is a significant source of lead exposure in young children. According to the 2022 American Community Survey estimate, PA ranks fifth in the nation for the percentage of housing units identified as having been built before 1950, when lead paint was most prevalent.⁵ Other sources of lead exposure include toys, ceramics, and other consumer products.³ Drinking water can also be a source of lead exposure when it flows through older lead plumbing or pipes where lead solder has been used (which can occur in newer plumbing as well).

Department of Health Strategies

Lead poisoning is a preventable environmental health hazard and, if not addressed, affects families regardless of race, ethnicity, or socioeconomic status. In recent years, there has been a national reduction in children's BLLs. The Department continues to provide resources to families to prevent and address elevated blood lead through multiple strategies.

- Through the federally funded Childhood Lead Poisoning Prevention Program (CLPPP), the Department is working collaboratively with 6 local county and municipal health departments in Allegheny, Chester, Montgomery, Luzerne, Lehigh, and York counties to reduce lead exposure and promote childhood lead poisoning prevention. Local partners are use CLPPP funding to implement strategies and activities to ensure blood lead testing and reporting, enhance the ability to collect data, strengthen population-based interventions, and strengthen processes to identify lead-exposed children and link them to services.
- The Department maintains a toll-free lead information hotline (1-800-440-LEAD) to provide information about lead poisoning prevention, testing, follow-up, and local resources for assistance.
- In 2022, lead abatement efforts continued through the federally funded Lead Hazard Control Program (LHCP) to protect PA's children from the long-term effects of lead poisoning and evaluate living conditions within the home to obtain healthier outcomes for families. Funding was provided to local partners to contract with certified lead professionals. The Department also worked with partners in targeted high-risk areas across the state to identify and remove lead hazards in housing units occupied by low-income families with children 6 years of age and younger.
- The Department's community health nurses (CHNs) continue to monitor elevated lead levels (≥ 3.5 $\mu\text{g}/\text{dL}$) in children aged 6 and younger. CHNs cover the counties and areas of the state not covered by the 11 county and municipal health departments (CMHDs). The CMHDs include 7 counties (Allegheny, Bucks, Chester, Delaware, Erie, Montgomery, and Philadelphia) and 4 municipal (Allentown, Bethlehem, Wilkes-Barre, and York city) health departments that have their own specific case management protocols. CHNs perform the following: 1) contact families to provide education on laboratory results, potential sources of lead exposure, and actions to take to prevent/decrease the risk of exposure and help facilitate follow-up testing between clients and their pediatricians; 2) encourage every family of children with levels of 3.5 $\mu\text{g}/\text{dL}$ and above to discuss the potential need for an environmental investigation with their healthcare provider; 3) work with the pediatrician and facilitate referrals to obtain home inspections, which could identify the source of exposure as well as provide hands-on education to parents; and 4) provide referrals to the PA Special Supplemental Nutrition Program for Women, Infants and Children (WIC) and early intervention programs where appropriate.
- In 2022, the Department continued an ongoing collaboration with the Pennsylvania Department of Human Services on a data match project to share data between the Medicaid claims database and the lead surveillance database. The data match will lead to improved quality lead data and better service provision for Medicaid-enrolled children.

In August 2019, the administration launched the Lead-Free PA Initiative, which seeks to increase access to blood lead level testing for children, increase local response efforts, and plan for the training of more certified lead abatement professionals. The Department and other state agencies participate in an interagency workgroup to achieve the goals of the Lead-Free PA Initiative. This report is intended to provide information that is concise, comprehensible, and accessible to the public. Although lead surveillance should be considered an ongoing process, the goal of the report is to provide meaningful, useful, and

easy-to-access data to the Commonwealth and its residents, so that the data can be better used for decision-making, targeting of resources, and implementing initiatives aimed at preventing exposure to lead.

Definitions

Age: Age of the child at the time of the test, expressed in months. Children under age 2 are 0–23 months, and children under age 6 are 0–71 months.

Blood lead level (BLL): The numeric result of a blood lead test, expressed in micrograms per deciliter ($\mu\text{g}/\text{dL}$)

Capillary: A blood lead test with blood drawn by a finger stick

Confirmed EBLL $\geq 3.5 \mu\text{g}/\text{dL}$: One venous blood lead test $\geq 3.5 \mu\text{g}/\text{dL}$ or two capillary blood lead tests $\geq 3.5 \mu\text{g}/\text{dL}$ drawn within 12 weeks of each other

Confirmed EBLL $\geq 5 \mu\text{g}/\text{dL}$: One venous blood lead test $\geq 5 \mu\text{g}/\text{dL}$ or two capillary blood lead tests $\geq 5 \mu\text{g}/\text{dL}$ drawn within 12 weeks of each other

Confirmed EBLL $\geq 10 \mu\text{g}/\text{dL}$: One venous blood lead test $\geq 10 \mu\text{g}/\text{dL}$ or two capillary blood lead tests $\geq 10 \mu\text{g}/\text{dL}$ drawn within 12 weeks of each other

Electronic lab reporting (ELR): The system by which blood lead reports are submitted electronically from a laboratory's system to PA-NEDSS

Elevated blood lead level (EBLL): A BLL $\geq 5 \mu\text{g}/\text{dL}$

Ethnicity: Hispanic or non-Hispanic

Micrograms per deciliter ($\mu\text{g}/\text{dL}$): The amount of lead in the blood, measured by micrograms of lead per deciliter of blood

Municipality: A political subdivision of a state within which a municipal corporation has been established to provide general local government for a specific population concentration in a defined area

Not elevated: A child with a confirmed venous or capillary BLL $< 5 \mu\text{g}/\text{dL}$, or who had an initial elevated capillary BLL that was found to be $< 5 \mu\text{g}/\text{dL}$ on either a venous or capillary follow-up test

Online key entry: Manual entry of blood lead reports into PA-NEDSS

Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS): the Pennsylvania Department of Health's online disease surveillance system. It serves as the Department's reporting system for all reportable conditions and has been utilized for childhood lead surveillance since 2003.

Race: White, Black or African American, Asian, Other (multiracial children, American Indians, Alaska Native, and Pacific Islanders), or Unknown

Race/Ethnicity: Non-Hispanic White, non-Hispanic Black or African American, Hispanic, and non-Hispanic Asian

Rural versus urban counties: The Center for Rural Pennsylvania defines rural and urban counties in terms of population density. Those counties with a population density above the state average (284 persons per square mile) are considered urban, and those below the state average are considered rural. For more information and definitions concerning rural and urban counties, please see the Center for Rural PA's website at: http://www.rural.palegislature.us/demographics_rural_urban.html.

Data Methods and Case Definitions

Reporting of Test Results and Case Investigations

In Pennsylvania, clinical laboratories are required to report all BLL results from both venous and capillary specimens for persons under 16 years of age to the Pennsylvania Department of Health (28 Pa. Code § 27.34). In addition, clinicians are required to report cases of lead poisoning for children under 16 years and for pregnant persons (28 Pa. Code § 27.34). Reports are submitted electronically (either through electronic laboratory reporting or online key entry) to the Department through NEDSS. In 2022, reports with a BLL ≥ 3.5 $\mu\text{g}/\text{dL}$ were assigned to public health investigators for follow-up based on the location of the patients' residences. Investigators reviewed, verified, and corrected, when necessary, critical pieces of information such as date of birth, address, and specimen source.

It is quite common for different entities to report the same BLL test result. For example, the ordering provider and the lab performing the analysis may both report the same test. The Department does not discourage reporting from multiple sources, as it maximizes the likelihood that reporting will occur. In addition, different reporters often have different information about the patient—for instance, one may know more details about the specimen source (capillary or venous), and another may have better address information. PA-NEDSS is designed to handle duplicate reports from different sources. Several strategies are used in PA-NEDSS to ensure that all reports pertaining to the same patient are assigned to a single patient identifier. For the purposes of this annual report, tests with identical specimen collection dates and identical BLL results from the same patient were considered as a single test. The total number of BLL tests was defined as the total number of deduplicated BLL tests obtained from children who were within the specified age categories during 2022. All BLL tests were counted, including those collected for screening, confirmation or follow-up purposes. Since many children had more than one BLL test during the year, the total number of children tested is less than the total number of BLL tests performed. Per-child summary BLL measures were calculated using all BLL results obtained while the child was in the given age category.

Case Definition

In May 2012, the CDC accepted the recommendation from the Advisory Committee on Lead Poisoning Prevention to eliminate the term “level of concern” (associated with the level of 10 $\mu\text{g}/\text{dL}$) and to begin using a reference value of 5 $\mu\text{g}/\text{dL}$ based on the 97.5 percentile of the blood lead distribution among US children.^{3,6} A new case definition was officially implemented by the CDC in 2016 and is used in this report to identify children with confirmed EBLL. The CDC also updated the BLRV to 3.5 $\mu\text{g}/\text{dL}$ in 2021. Pennsylvania implemented this change on January 1, 2022. A confirmed EBLL is defined as a venous blood lead test ≥ 3.5 $\mu\text{g}/\text{dL}$, or two capillary blood lead tests ≥ 3.5 $\mu\text{g}/\text{dL}$ drawn within 84 days (12 weeks) of each other. An unconfirmed EBLL is defined as a capillary blood lead test ≥ 3.5 $\mu\text{g}/\text{dL}$ with no other blood lead test done in the next 84 days.^{7,8}

To apply the CDC case definition, several different data elements need to be evaluated. These data elements were handled as follows in our analyses:

- If the specimen collection date was missing or illogical, the laboratory received date or result date was used instead. If all 3 were missing, the reported date was used.
- Specimens with unknown specimen sources or characterized as simply “blood” (as opposed to venous or capillary) were treated as if they were capillary specimens.
- Tests with undetectable BLLs were either reported as below a numeric detection limit or with a qualitative result of “negative,” “not detected,” or “normal.”
- If an elevated capillary test was obtained on a child near the end of 2022 or as the child neared the limit of a particular age category, and if another elevated test result was obtained within the next 84 days, the initial elevated test was considered to be confirmed, even if the confirmatory test occurred in 2022 or outside of the age category. For example, if a child had an elevated capillary test at 23 months of age in November 2022 and received a confirmatory follow-up test within 12 weeks (in 2023), this was considered an EBLL result in 2022 for a child “aged 0–23 months.”

For children who had multiple BLL tests performed, they could qualify for more than one case definition category (for example, they may have had an unconfirmed elevated test and then, 6 months later, had another elevated test that was confirmed). In these situations, a child was assigned to the highest BLL case definition category for which they qualified.

Statistical Methods

All BLL test data obtained on children less than 16 years of age in 2022 were extracted from the PA-NEDSS database. Analyses were performed on a per-test or per-child basis as indicated in the findings below.

Most of the analyses in this report are limited to children in 2 overlapping age categories: under 2 years of age (0–23 months) and under 6 years of age (0–71 months). Age was defined as age at the time of the specimen collection date.

Information on race and ethnicity is not routinely collected or stored by most laboratories. Only about 60% of the reports contained race/ethnicity data. Since obtaining more complete race and ethnicity data is critical to evaluating disparities in screening and lead exposures, data in PA-NEDSS were supplemented with data from the PA birth registry, supplied by the Bureau of Health Statistics. Children with lead test results in PA-NEDSS were first matched to the 2016-2022 birth certificate data using a deterministic match method using first name, last name, date of birth, gender, and zip code by the Bureau of Epidemiology program staff. After the initial match of 104,666 children, unmatched children were matched to the 2016-2022 birth certificate data using Match pro, a probabilistic matching method. An additional 10,515 children were matched using this method.

We matched 72% (115,181 out of 160,177) of children under the age of 6 who had BLL test results reported in PA-NEDSS to children in the birth registry. Information from the birth registry was added to the PA-NEDSS lead testing data if a PA-NEDSS record matched to a birth registry record by name and a combination of date of birth, sex, and residential zip code. Race and ethnicity information from the birth registry was added to the PA-NEDSS lead testing data if ethnicity was missing or unknown and if the race was listed as “Unknown” or “Other.” After the matching process was completed, race information was available for nearly 90% of the children under 6 years of age reported to PA-NEDSS with BLL test results. The

race and ethnicity categories aligned with those used in the US census. Because of small numbers, multiracial children, American Indians, Alaska Natives, and Pacific Islanders were combined into an “Other” category. For race and ethnicity analyses by county, categories were combined and collapsed into non-Hispanic Black or African American, non-Hispanic White, and Hispanic. Children in the Asian, Pacific Islander, American Indian, Alaska Native, Other and Unknown categories were not included in the county analyses due to small numbers.

For the per-child analyses, 2 measures were used to indicate their BLL status:

- The maximum BLL was defined as the highest venous BLL obtained from a child in 2022 while they were in the specified age category. If a child had no venous BLL test performed during that time period, maximum BLL was defined as the highest BLL from a capillary or unknown specimen source. Venous results were ranked over capillary results because capillary test results may be skewed by the presence of lead dust on the skin.
- EBLL confirmation status was determined as described in the case definition section above.

County-specific Analysis

For county-specific analyses, the residential address accompanying the report that contained the BLL result of interest was used to determine the county. For the maximum BLL measure, the county was determined from the report containing the maximum test result. For the EBLL confirmation status measure, county was determined from the address accompanying the initial EBLL. PA-NEDSS attempts to geocode all residential addresses. For addresses that were successfully verified, county was based on the actual home address. If an address could not be verified, the county was based on the centroid of the residential zip code. A small proportion of children did not have a residential address reported; the county was set by the location of the provider who ordered the test.

Intercensal population estimates for 2022 by county, age, race, and ethnicity were obtained from the National Center for Health Statistics (NCHS) website (Vintage 2019 bridged-race postcensal population estimates, https://www.cdc.gov/nchs/nvss/bridged_race.htm).⁹ These figures were used to calculate the proportion of children tested for BLL and the proportion of children with EBLLs in the county-specific analysis.

Seventeen PA counties with the largest number of children under 6 years of age were selected for county-specific race/ethnicity analyses.

Municipality-specific Analysis

For the municipality-level analyses, the residential address accompanying the report that contained the EBLL confirmation status measure was used to determine the specific municipality. PA-NEDSS attempts to geocode all residential addresses. For addresses that were successfully verified, the municipality was based on the report address. If the report address was missing, then the home address was used. If an address could not be verified

automatically, it was verified by the application of manual geocoding. If an address still could not be verified, the municipality was based on the centroid of the residential zip code. For municipality-level analyses, the population estimate of children was obtained by the 2019 American Community Survey, the most recent and available population data source at the municipal level.

Ten PA municipalities with the highest number of children under 6 years of age, as well as 2 other cities with an Act 315 municipal health department were selected for municipality-specific analyses. These included Philadelphia, Pittsburgh, Allentown, Reading, Erie (city), Upper Darby Township, Harrisburg, Scranton, Lancaster, York City, Bethlehem, and Wilkes-Barre.

Data Limitations

The 2022 Childhood Lead Surveillance Annual Report presents an analysis of surveillance data displayed in graphic and tabular form, in keeping with CDC guidance for analysis of childhood lead data.

Users of the report should be aware that public health surveillance data for childhood lead has inherent limitations that influence the interpretation of the data. Data such as specimen source, the residence of child, race, and ethnicity, and other important information may be missing on laboratory test results. As described in the Methods section, efforts were made to fill these gaps. Supplementing race and ethnicity data with information from the birth registry was done for the first time for the 2018 report and is successfully continued in this report.

In addition, Allegheny County and Philadelphia were the only counties in PA with mandatory testing regulations or requirements for children between 9 and 12 months and at 24 months. In May 2019, the Philadelphia city council passed a bill requiring physicians to test children twice before the age of 2. However, PA does not mandate universal and complete screening of all children. Therefore, testing of children for BLL is targeted rather than random, which makes interpretation of rates of EBLLs by geographic area or demographic factors difficult.

An emerging issue is the increasing use of point-of-care testing devices for blood lead screening. A growing number of clinical practices can perform capillary lead screening tests on children onsite. These providers are often unaccustomed to reporting results to the Department and are unaware of reporting requirements. This could adversely affect the number of screening test results counted and skew downward the proportion of children screened. The Department is working with many clinics that are using this equipment to ensure that BLLs are reported. Furthermore, some point-of-care analyzers have been found to give falsely low BLL results when used to analyze venous blood. These devices should be used only on capillary specimens, but the Department generally does not know the type of equipment used to perform BLL tests and cannot control for this source of uncertainty. The impact of this issue cannot be assessed, as the type of testing device used is not captured in the PA-NEDSS surveillance data sets. Between May and September 2022, Magellan Diagnostics issued several recalls for Leadcare test kits dating back to October 2020 for potentially underestimating blood lead levels. It is unknown at this time what impact this could have on lead test results in PA.

High rates of children with EBLLs in one area may reflect a true higher exposure risk in that area, or it may reflect more robust and targeted testing in that area. The burden of childhood EBLLs is best understood through a series of metrics: the percentage of children tested; the percentage who go on to have retests where appropriate (and conversely the percentage who do not get appropriate testing and follow-up); and, finally, the percentage of children with BLLs 5–9.9 µg/dL and those ≥ 10 µg/dL. This report shows both the number and percentage of children tested with unconfirmed EBLLs ≥ 3.5 µg/dL, confirmed EBLLs 3.5–4.9 µg/dL, confirmed EBLLs 5–9.9 µg/dL, and confirmed EBLLs ≥ 10 µg/dL.

Discussion

Between 2021 and 2022, the percent of children under the age of 2 years tested for lead increased from 32.94% to 34.75% (an increase of 2,575 children tested). The percent of children under the age of 6 years tested increased from 18.72% to 19.72% (an increase of 4,159 children tested) from 2021 to 2022. Between 2021 and 2022, the percent of children under age 2 years with a confirmed EBLL ≥ 5 $\mu\text{g}/\text{dL}$ decreased from 2.29% to 1.95% of those tested (a decrease of 251 children), while the percent of children under age 6 years with a confirmed EBLL ≥ 5 $\mu\text{g}/\text{dL}$ decreased from 3.11% to 2.85% of those tested (a decrease of 276 children).

On October 28, 2022, CDC updated the blood lead reference value (BLRV) from 5.0 $\mu\text{g}/\text{dL}$ to 3.5 $\mu\text{g}/\text{dL}$.⁴ This value is also used to identify children who require case management given that, even at low levels, lead has been known to affect IQ, the ability to pay attention, and educational achievement. This change from the BLRV of 5 $\mu\text{g}/\text{dL}$ to 3.5 $\mu\text{g}/\text{dL}$ was implemented in PA on January 1, 2022. Children who had a capillary between 3.5-4.9 $\mu\text{g}/\text{dL}$ required a follow-up test in 2022; previously it was ≥ 5 $\mu\text{g}/\text{dL}$. The category of confirmed between 3.5- < 5 $\mu\text{g}/\text{dL}$ was added to this report for 2022. There were 1,064 children (1.17%) under age 2 years with an EBLL 3.5-4.9 $\mu\text{g}/\text{dL}$. There were 2,758 (1.72%) children under age 6 years with an EBLL 3.5-4.9 $\mu\text{g}/\text{dL}$. The percent of children with an unconfirmed EBLL increased from 0.96% to 2.08% for children under age 2 years (an increase of 1,039 children) and from 1.26% to 2.60% for children under age 6 years (an increase of 2,205 children), among those tested. The percent of children aged 0-15 years who were appropriately retested after an elevated capillary test decreased from 59.2% to 52.3% between 2021 and 2022. This may be because providers had been used to requiring follow up tests only for results ≥ 5 $\mu\text{g}/\text{dL}$.

Pennsylvania was able to explore race and ethnicity data more fully for the first time in 2018 by matching children's BLL testing data to birth certificate data to determine the race for nearly 60% of children who did not have race or ethnicity information provided on their BLL testing results data. The same approach was implemented for this report. Testing rates for non-Hispanic Black or African American children and non-Hispanic Asian children were higher statewide than for Hispanic and non-Hispanic White children. Confirmed EBLL rates were also higher among non-Hispanic Black or African American children, both as a percentage of children tested and as a percentage of the population, for both age groups. In general, Hispanic and non-Hispanic Asian children had percentages of EBLs in-between values for non-Hispanic Black or African American children and non-Hispanic White children.

In general, for children under the age of 2 and under the age of 6, municipalities/cities had a higher percentage of children tested for lead than in their respective counties. In general, the percentage of children with EBLs among those tested and as a percentage of the population was also higher in all municipalities/cities than in their respective counties. For the largest counties, where race and ethnicity data are presented, most had higher testing rates among non-Hispanic Black or African American and Hispanic children than non-Hispanic White children. However, that pattern was not seen in Allegheny, Erie, Lackawanna, Luzerne, and Westmoreland counties. In many of these counties, the percentage of those tested with EBLs was highest among minority populations, although not all counties had this pattern.

The eleven county and municipal health departments (CMHDs) include seven counties (Allegheny, Bucks, Chester, Delaware, Erie, Montgomery, and Philadelphia) and four municipal (Allentown, Bethlehem, Wilkes-Barre, and York city) health departments. Testing rates for the eleven CMHDs coverage area range from 18.35% (Bucks County) to 47.44% (Allegheny County) for children under age 2 years and 9.58% (Bucks County) to 27.10% (Philadelphia) for children under age 6 years. Confirmed EBLLs >3.5 µg/dL range from 0.95% (Bucks County) to 11.48% (York City) for children under age 2 and 1.05% (Bucks County) to 15.80% (York City) for children under age 6.

As mentioned previously, not all the point-of-care testing results were reported to PA-NEDSS. Because of this, for some areas the testing rates may actually be higher than reported and the percent tested with EBLLs may actually be lower than what is in this report. As providers move toward point-of-care testing, the Department is working to facilitate reporting of test results to achieve an accurate understanding of the burden of childhood lead exposure. The Department is also working with laboratories to increase the use of electronic reporting of testing results to reduce the resource burden and errors associated with faxed results and hand-keyed data entry.

Due to the small number of children with very high lead levels reported, we have planned an additional report to look at follow-up testing by age, county, and race/ethnicity using multiple years of data for children with very high lead levels. In addition, a childhood lead hospitalization report is also planned, with multiple years of data combined.

In summary, in 2022 compared to 2021, testing rates have increased, the percent of confirmed EBLLs has increased, and the percent of unconfirmed EBLLs has increased. This is most likely due to the restrictions imposed during the COVID-19 pandemic lessening during 2022. Parents may have been reluctant to risk exposure to COVID at their provider or a lab to get their children a BLL test or the follow-up confirmatory BLL test. The percent of confirmed EBLLs has increased because of the addition of cases with BLL test results between 3.5-4.9 µg/dL. The percent of unconfirmed tests may have increased because providers have been accustomed to prior requirements for follow-up tests for capillaries ≥ 5 µg/dL and may not have been asking parents to do follow-up tests for BLL results between 3.5-4.9 µg/dL.

Findings

Statewide Summaries by Age:

The Commonwealth of Pennsylvania does not have a universal childhood BLL testing law, so there is no mandate for children to be tested by a certain age. However, the Early Periodic Screening, Diagnosis and Treatment (EPSDT) program (administered by the Pennsylvania Department of Human Services) requires providers to test children on Medical Assistance twice by age 24 months (between 9 and 11 months and at 24 months). Furthermore, most clinical practice guidelines recommend testing children under age 7 and focusing on children at ages 1 and 2.

The following charts include statewide aggregate childhood lead testing data broken out by the age groupings of children tested and the age at the time of their highest result. The charts also include breakouts of sex, race, ethnicity, and the range of the highest BLL.

Table 1: Summary of Blood Lead Tests Performed in 2022 by Age Category

Age category*	Total number of tests†	Capillary test#		Venous test	
		N	%	N	%
0–23 months (under 2 years)	97,854	66,656	68.12	31,198	31.88
0–71 months (under 6 years)	175,109	111,499	63.67	63,610	36.33
0–15 years	182,790	112,386	61.48	70,404	38.52

*Age at time of specimen collection

†Total number of deduplicated blood tests obtained on children within the age category. A blood lead test may be collected for screening, confirmation, or follow-up. Many children had more than one test in any given year. The remainder of the tables were analyzed on a per child basis rather than per test.

#Blood specimens of unknown sources were treated as though they were capillary tests.

Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 2: Characteristics of Children Tested for Lead by Age Category, 2022

	Children aged 0–23 months		Children aged 0–71 months	
	N	% of total	N	% of total
Total number of children tested†	90,886	100.00	160,177	100.00
Age at time of maximum BLL				
Under 1 year	47,689	52.47	47,689	29.77
One year	43,197	47.53	42,690	26.65
Two years	-	-	49,691	31.02
Three years	-	-	8,947	5.59
Four years	-	-	6,150	3.84
Five years	-	-	5,010	3.13
Sex				
Female	43,963	48.37	77,280	48.25
Male	46,823	51.52	82,700	51.63
Unknown	100	0.11	197	0.12
Race				
Asian	4,300	4.73	7,733	4.83
Black or African American	14,872	16.36	28,756	17.95
White	57,644	63.42	95,063	59.35
Other^	3,287	3.62	5,749	3.59
Unknown	10,783	11.86	22,876	14.28
Ethnicity				
Hispanic	12,208	13.43	22,698	14.17
Non-Hispanic	66,160	72.79	109,551	68.39
Unknown or missing	12,518	13.77	27,928	17.43
Maximum BLL (µg/dL)*				
<3.5	86,075	94.71	148,651	92.80
3.5–4.9	2,195	2.42	5,111	3.19
5–9.9	1,929	2.12	4,712	2.94
10–19.9	543	0.60	1,331	0.83
20–44.9	132	0.15	332	0.21
45–59.9	8	0.01	25	0.02
60–69.9	2	0.00	8	0.00
≥ 70	2	0.00	7	0.00

†Number of Pennsylvania children within the age category who had at least one blood lead test done with a specimen collection date in 2022

^Other race includes multiracial children, American Indians, and Pacific Islanders.

*Highest venous blood lead level (BLL) obtained per child in 2022, or highest BLL from a capillary or unknown specimen source, if no venous test was performed

Data sources: Pennsylvania Department of Health, PA-NEDSS, Vital Records

Statewide Summaries by Confirmed Elevated Status:

The following charts display EBLL by confirmation status. Confirmation status can be: not elevated, elevated but not confirmed, or confirmed elevated. Also included are data on how the results were confirmed. Children can be tested for lead by either a finger stick (capillary) or blood draw (venous). Because capillary tests are more subject to contamination, they are less reliable than venous tests, so venous tests are preferred to get the most accurate result. It is not always possible to perform a venous test, so elevated capillary results are confirmed with either another capillary test or a venous test. Venous testing requires a trained phlebotomist, and some clinical settings may not have this expertise; in addition, successfully getting a venous specimen in very small children can be difficult.

Table 3: Elevated Blood Lead Confirmation Status per 2016 CDC Case Definition* by Age Category, 2022

	Children aged 0–23 months		Children aged 0–71 months	
	N	% of total	N	% of total
Total number of children tested	90,886	100.00	160,177	100.00
Confirmation status				
Not elevated (< 3.5 µg/dL)**	86,163	94.80	148,680	92.82
Unconfirmed elevated (≥ 3.5 µg/dL)†	1,889	2.08	4,165	2.60
Confirmed 3.5–4.9 µg/dL	1,064	1.17	2,758	1.72
Confirmed 5–9.9 µg/dL	1,268	1.40	3,274	2.04
Confirmed ≥ 10 µg/dL	502	0.55	1,300	0.81
Confirmed ≥ 3.5 µg/dL	2,834	3.12	7,332	4.57

*CDC case definition defines a confirmed elevated BLL as one venous blood lead test ≥3.5 µg/dL, or 2 capillary blood lead tests ≥3.5 µg/dL drawn within 12 weeks of each other.

**The child had either no BLL ≥3.5 µg/dL or had an initially elevated capillary BLL that was found to be <3.5 µg/dL on either venous or capillary retest.

†The initial capillary test was ≥3.5 µg/dL, but the test result was not confirmed by a venous or capillary retest within 12 weeks.

Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 4: Details of Elevated Blood Lead Confirmation Status* by Age Category, 2022

		Children aged 0–23 months		Children aged 0–71 months	
		N	% of total	N	% of total
Total number of children tested		90,886	100.00	160,177	100.00
Confirmation status	Outcome				
Not elevated (< 5 µg/dL)	BLL < 5 µg/dL	84,547	93.03	145,639	90.92
	Repeat capillary test did not confirm the initial elevated capillary test. The venous test did not confirm the initial elevated capillary test.	95	0.10	150	0.09
Unconfirmed elevated (≥3.5 µg/dL) [†]	Not retested appropriately	1,521	1.67	2,891	1.80
	Capillary confirmed by repeat capillary test	1,889	2.08	4,165	2.60
Confirmed 3.5–4.9 µg/dL	Capillary confirmed by repeat capillary test	18	0.02	30	0.02
	Capillary confirmed by venous test	334	0.37	581	0.36
	Venous test	712	0.78	2,147	1.34
Confirmed 5–9.9 µg/dL	Capillary confirmed by repeat capillary test	25	0.03	37	0.02
	Capillary confirmed by venous test	365	0.40	689	0.43
	Venous test	878	0.97	2,548	1.59
Confirmed ≥ 10 µg/dL	Capillary confirmed by repeat capillary test	8	0.01	8	0.00
	Capillary confirmed by venous test	151	0.17	279	0.17
	Venous test	343	0.38	1,013	0.63

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

[†] Initial capillary test was ≥3.5 µg/dL, but the test result was not confirmed by a venous or capillary retest within 12 weeks.

Data sources: Pennsylvania Department of Health, PA-NEDSS.

Summary of Confirmation Testing by Initial Capillary Test Level:

Confirming a capillary blood lead test with a venous blood lead test is an important step in accurately assessing a child's blood lead level and ensuring appropriate follow-up care and interventions to prevent lead exposure and mitigate the effects of lead toxicity.

Capillary blood lead tests are used to screen children for lead exposure because they are quick and easy to perform, but they may not be as accurate as venous blood lead tests. If a capillary blood lead test indicates that the child may have an elevated blood lead level, it is important to confirm the result with a venous blood lead test because it provides a more accurate measurement of the child's blood lead level and can help to rule out false positive or false negative results from the capillary blood lead test. False positive results can lead to unnecessary interventions and follow-up testing, while false negative results can result in missed opportunities for early detection and treatment of lead exposure.

The CDC recommends a confirmatory venous sample after an initial elevated capillary test and has a recommended schedule for obtaining the venous sample based on the initial capillary level. Overall, only 52.3% of children under 16 years of age with initial capillary blood lead levels greater than 5 ug/dl had capillary or venous confirmation tests within 12 weeks. Three out of the 51 children with initial capillary test results ≥ 45 ug/dl did not have venous confirmation tests within 12 weeks; however, for these extremely high values the confirmation should be performed within 48 hours based on CDC's lead confirmation test recommendations. About 19% of children with an initial capillary test result of 20-44 ug/dl did not have a venous confirmation test within 12 weeks. At this range, the confirmation test should have been performed within two weeks based on CDC recommendations. A venous confirmation test should be done within a month for an initial capillary 10-19 ug/dl, but 33% of the children did not have one within 12 weeks. (Table 5) Two additional tables were created to depict the confirmation test periods for children 0-71 months and 0-23 months. (Table 5A and 5B) Tables 5, 5A and 5B also provide information on the number of children with very high lead levels in PA.

Table 5: Confirmation After an Elevated Capillary Blood Lead Test by Capillary Test Level, Children Aged 0-15 years, 2022

Blood lead level of initial elevated capillary test (ug/dL)	Number of children*	Children with a diagnostic venous test within 12 weeks [†]		Children with either a venous or capillary retest within 12 weeks [†]	
		N	%	N	%
3.5-4.9	4,130	1608	38.93	1,704	41.26
5-9.9	3,516	1948	55.4	2,044	58.13
10-19.9	967	630	65.15	651	67.32
20-44.9	307	244	79.48	248	80.78
45-59.9	27	26	96.30	26	96.30
60-69.9	11	9	81.82	9	81.82
≥ 70	13	12	92.31	13	100.00
Overall	8,971	4477	49.91	4,695	52.34

*Children aged 0-15 years

[†]Retest results may not be in the same blood lead level range as the initial capillary test.

Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 5A: Confirmation After an Elevated Capillary Blood Lead Test by Capillary Test Level, Children Aged 0-71 months, 2022

Blood lead level of initial elevated capillary test (µg/dL)	Number of children*	Children with a diagnostic venous test within 12 weeks†		Children with either a venous or capillary retest within 12 weeks†	
		N	%	N	%
3.5-4.9	4,071	1,598	39.25	1,694	41.61
5-9.9	3,460	1,939	56.04	2,035	58.82
10-19.9	947	623	65.79	643	67.90
20-44.9	301	241	80.07	245	81.40
45-59.9	27	26	96.30	26	96.30
60-69.9	11	9	81.82	9	81.82
≥ 70	13	12	92.31	13	100.00
Overall	8,830	4,448	50.37	4,665	52.83

*Children aged 0-71 months

†Retest results may not be in the same blood lead level range as the initial capillary test.

Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 5B: Confirmation After an Elevated Capillary Blood Lead Test by Capillary Test Level, Children Aged 0-23 months, 2022

Blood lead level of initial elevated capillary test (µg/dL)	Number of children*	Children with a diagnostic venous test within 12 weeks†		Children with either a venous or capillary retest within 12 weeks†	
		N	%	N	%
3.5-4.9	2,036	859	42.19	920	45.19
5-9.9	1,706	1,029	60.32	1,093	64.07
10-19.9	484	338	69.83	349	72.11
20-44.9	152	126	82.89	128	84.21
45-59.9	14	14	100.00	14	100.00
60-69.9	8	7	87.50	7	87.50
≥ 70	6	6	100.00	6	100.00
Overall	4,406	2,379	53.99	2,517	57.13

*Children aged 0-23 months

†Retest results may not be in the same blood lead level range as the initial capillary test.

Data sources: Pennsylvania Department of Health, PA-NEDSS.

Reporting by Method and Organization:

The chart below displays data on how BLL reports were submitted to PA-NEDSS and who submitted the report. By law, all BLL tests analyzed by laboratories on children under 16 years of age are required to be reported to the Department. Reports can be submitted by electronic laboratory reporting (ELR) or by online key-entry. ELR is the preferred method of receiving reports, as the information is usually more accurate, complete, and timely. From 2013 to 2022, the number of laboratories reporting through electronic laboratory reporting increased from 20 to 39.

Table 6: Blood Lead Reporting by Method of Report and Type of Reporting Organization, 2016–2022

Method of report		2017	2018	2019	2020	2021	2022
Number of reports submitted [†]	ELR*	169,675	175,802	178,999	150,321	168,781	172,185
	Online key-entry by lab	13,011	11,720	10,769	4,967	3,750	3,519
	Online key-entry by provider [#]	2,775	7,423	11,925	16,487	13,514	13,152
Total		185,461	194,945	201,693	171,775	186,045	188,856
% ELR		91.49	90.18	88.75	87.51	90.07	91.2

*ELR=electronic laboratory reporting

†The same test result may be reported by the ordering provider, the receiving laboratory, and/or the reference lab that performs the test. The data in this table are not deduplicated. Also, reports may contain more than one test result.

[#]Online key-entry by provider includes some test results key-entered by Department staff on behalf of providers. Data sources: Pennsylvania Department of Health, PA-NEDSS.

Testing Summaries by Race and Ethnicity:

The following are summaries of children under age 2 years and under age 6 years tested by race and ethnicity, including the number of children tested, the percent of the population tested, and confirmation status. For children ages 0-23 months, non-Hispanic Black or African American children and non-Hispanic Asian children were more often tested than Hispanic and non-Hispanic White children (38.72% and 36.30% versus 29.58% and 32.31%, respectively). Among those tested, non-Hispanic Black or African American and Hispanic children had higher percentages of EBLs of 3.5-9.9 µg/dL than non-Hispanic White children (3.88% and 3.83% versus 2.00%, respectively). Percentages of test results ≥10 µg /dL were also higher among non-Hispanic Black or African American and Hispanic children than non-Hispanic White children (0.75% and 0.93% versus 0.43%, respectively). Among those tested, non-Hispanic Black or African American and Hispanic children also had higher percentages of unconfirmed elevated results among those tested than did non-Hispanic White children. These same relationships were seen for children ages 0-71 months.

Table 7: Number of Children Aged 0–23 Months by Race/Ethnicity and Elevated Blood Lead Confirmation Status,* 2022

Race/Ethnicity	Population of children aged 0–23 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)			Confirmed 3.5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population***	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Total	261,569	90,886	34.75	1,889	2.08	0.72	2,332	2.57	0.89	502	0.55	0.19
Race/Ethnicity[^]												
Non-Hispanic White	160,853	51,977	32.31	939	1.81	0.58	1,042	2.00	0.65	222	0.43	0.14
Non-Hispanic Black or African American	34,232	13,255	38.72	298	2.25	0.87	514	3.88	1.50	99	0.75	0.29
Hispanic	41,277	12,208	29.58	338	2.77	0.82	467	3.83	1.13	114	0.93	0.28
Non-Hispanic Asian	11,252	4,085	36.30	43	1.05	0.38	76	1.86	0.68	15	0.37	0.13

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny and Philadelphia are currently the only counties with mandatory testing.

***Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

†2020 intercensal estimate

[^]Other and Unknown are not included in the table

Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Table 8: Number of Children Aged 0–71 Months by Race/Ethnicity and Elevated Blood Lead Confirmation Status,* 2022

Race/Ethnicity	Population of children aged 0–23 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)			Confirmed 3.5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population***	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Total	812,182	160,177	19.72	4,165	2.60	0.51	6,032	3.76	1.45	1,300	0.81	0.16
Race/Ethnicity[^]												
Non-Hispanic White	507,585	85,048	16.76	1,912	2.25	0.38	2,211	2.60	0.44	465	0.55	0.09
Non-Hispanic Black or African American	103,836	25,725	24.77	797	3.10	0.77	1,722	6.69	1.66	351	1.36	0.34
Hispanic	124,144	22,698	18.28	770	3.39	0.62	1,153	5.08	0.93	299	1.32	0.24
Non-Hispanic Asian	36,267	7,005	19.32	89	1.27	0.25	184	2.63	0.51	43	0.61	0.12

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months.

Allegheny and Philadelphia are currently the only counties with mandatory testing

***Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

†2020 intercensal estimate

[^]Other and Unknown are not included in the table

Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Testing Summaries by Major Municipality:

The following are summaries of children under age 2 years and under age 6 years tested in major municipalities, including the number of children tested, the percent of the population tested and confirmation status. Testing rates and percentages of children with EBLs among major municipalities/cities were generally higher than for their respective counties, for both children under the age of 2 years and under the age of 6 years. This finding likely highlights the historical burden of older housing stock and other urban sources of lead in Pennsylvania municipalities/cities. For children 0-23 months, testing rates were highest in Pittsburgh and lowest in Scranton, and the percentages of EBL ≥ 3.5 $\mu\text{g}/\text{dL}$ as a percentage of those tested were highest in the cities of Reading, York, Lancaster, and Scranton. Pittsburgh's and Philadelphia's testing rates may be higher due to the fact that in 2018, Allegheny County started mandatory blood lead testing for children between 9 and 12 months and at 24 months and in May 2019, the Philadelphia city council passed a bill requiring physicians to test children twice before the age of 2.

Table 9: Number of Children Aged 0–23 Months by Major Municipality and Elevated Blood Lead Confirmation Status,* 2022

Residence		Population of children aged 0–23 months [†]	Children tested**		Unconfirmed ≥ 3.5 $\mu\text{g}/\text{dL}$			Confirmed ≥ 3.5 $\mu\text{g}/\text{dL}$		
Municipality	County		N	% of population***	N	% of tested	% of population	N	% of tested	% of population
Philadelphia	Philadelphia	38,620	15,991	41.41	231	1.44	0.60	662	4.14	1.71
Pittsburgh	Allegheny	5,361	2,489	46.43	65	2.61	1.21	119	4.78	2.22
Allentown	Lehigh	3,345	1,381	41.28	69	5.00	2.06	39	2.82	1.17
Reading	Berks	2,885	1,155	40.03	71	6.15	2.46	142	12.29	4.92
Erie	Erie	2,108	853	40.46	43	5.04	2.04	51	5.98	2.42
Upper Darby township	Delaware	2,203	944	42.85	20	2.12	0.91	33	3.50	1.50
Scranton	Lackawanna	1,551	457	29.47	29	6.35	1.87	25	5.47	1.61
Bethlehem	Northampton/Lehigh	1,409	412	29.25	18	4.37	1.28	9	2.18	0.64
Harrisburg	Dauphin	1,625	729	44.85	49	6.72	3.01	27	3.70	1.66
Lancaster	Lancaster	1,537	516	33.57	10	1.94	0.65	42	8.14	2.73
York city	York	1,036	331	31.96	14	4.23	1.35	38	11.48	3.67
Wilkes-Barre	Luzerne	1,135	362	31.89	25	6.91	2.20	22	6.08	1.94
Pennsylvania Total		261,569	90,886	34.75	1,889	2.08	0.72	2,834	3.12	1.08

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months.

Allegheny and Philadelphia are currently the only counties with mandatory testing

***Percent was calculated as the number of children tested divided by the population of children in the municipality for the specified age range.

†2020 American Community Survey

Data sources: Pennsylvania Department of Health, PA-NEDSS., 2018 American Community Survey

Table 10: Number of Children Aged 0–71 Months by Major Municipality and Elevated Blood Lead Confirmation Status,* 2022

Residence		Population of children aged 0–71 months [†]	Children tested**		Unconfirmed ≥ 3.5 µg/dL			Confirmed ≥ 3.5 µg/dL		
Municipality	County		N	% of population***	N	% of tested	% of population	N	% of tested	% of population
Philadelphia	Philadelphia	11,9917	30,276	25.25	480	1.59	0.40	2,069	6.83	1.73
Pittsburgh	Allegheny	16,645	4,344	26.10	171	3.94	1.03	272	6.26	1.63
Allentown	Lehigh	10,387	2,633	25.35	162	6.15	1.56	125	4.75	1.20
Reading	Berks	8,959	2,512	28.04	176	7.01	1.96	370	14.73	4.13
Erie	Erie	6,546	1,601	24.46	104	6.50	1.59	158	9.87	2.41
Upper Darby township	Delaware	6,840	1,848	27.02	60	3.25	0.88	96	5.19	1.40
Scranton	Lackawanna	4,815	863	17.92	71	8.23	1.47	85	9.85	1.77
Bethlehem	Northampton/Lehigh	4,374	799	18.27	38	4.76	0.87	25	3.13	0.57
Harrisburg	Dauphin	5,047	1329	26.33	98	7.37	1.94	83	6.25	1.64
Lancaster	Lancaster	4,772	1054	22.09	27	2.56	0.57	113	10.72	2.37
York city	York	3,216	576	17.91	29	5.03	0.90	91	15.80	2.83
Wilkes-Barre	Luzerne	3,525	783	22.21	55	7.02	1.56	65	8.30	1.84
Pennsylvania Total		812,182	160,177	19.72	4,165	2.60	0.51	7,332	4.57	1.61

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months.

Allegheny and Philadelphia are currently the only counties with mandatory testing.

***Percent was calculated as the number of children tested divided by the population of children in the municipality for the specified age range.

†2020 American Community Survey

Data sources: Pennsylvania Department of Health, PA-NEDSS., 2019 American Community Survey

Testing Summaries by County and Race/Ethnicity for Selected Counties:

The following are summaries of children under age 2 years and under age 6 years by county and race/ethnicity, including the number of children tested, the percent of the population tested and confirmed EBLLs of ≥3.5 µg/dL. Asian, Pacific Islander, American Indian and Alaska Native, Other, and Unknown races are not included. The 17 counties with the largest populations were selected to include the largest cities and the counties with county or municipal health departments.

Table 11: Number of Children with Confirmed EBLL* by County of Residence and Race/Ethnicity, Children Aged 0–23 Months, for Select Counties, 2022**

County of residence	Race/Ethnicity	Population 0-23 months	Children tested*		Confirmed EBLL \geq 3.5		
			N	% of population**	N	% of tested	% of population
Allegheny	Non-Hispanic Black or African American	4,515	1,834	40.62	89	4.85	1.97
Allegheny	Hispanic	885	299	33.79	13	4.35	1.47
Allegheny	Non-Hispanic White	15,381	7,296	47.44	112	1.54	0.73
Berks	Non-Hispanic Black or African American	422	123	29.15	8	6.50	1.90
Berks	Hispanic	3,878	1,142	29.45	118	10.33	3.04
Berks	Non-Hispanic White	4,378	1,033	23.60	67	6.49	1.53
Bucks	Non-Hispanic Black or African American	618	153	24.76	0	0.00	0.00
Bucks	Hispanic	1,309	339	25.90	1	0.29	0.08
Bucks	Non-Hispanic White	8,251	1,242	15.05	15	1.21	0.18
Chester	Non-Hispanic Black or African American	585	207	35.38	2	0.97	0.34
Chester	Hispanic	1,603	746	46.54	20	2.68	1.25
Chester	Non-Hispanic White	7,525	1,782	23.68	24	1.35	0.32
Cumberland	Non-Hispanic Black or African American	361	113	31.30	0	0.00	0.00
Cumberland	Hispanic	485	110	22.68	1	0.91	0.21
Cumberland	Non-Hispanic White	3,862	991	25.66	21	2.12	0.54
Dauphin	Non-Hispanic Black or African American	1,247	559	44.83	11	1.97	0.88
Dauphin	Hispanic	1,365	433	31.72	13	3.00	0.95
Dauphin	Non-Hispanic White	2,921	1,001	34.27	13	1.30	0.45
Delaware	Non-Hispanic Black or African American	3,492	1,547	44.30	32	2.07	0.92
Delaware	Hispanic	1,163	606	52.11	16	2.64	1.38
Delaware	Non-Hispanic White	6,393	2,315	36.21	16	0.69	0.25
Erie	Non-Hispanic Black or African American	662	270	40.79	16	5.93	2.42
Erie	Hispanic	569	138	24.25	6	4.35	1.05
Erie	Non-Hispanic White	3,553	1,250	35.18	35	2.80	0.99

County of residence	Race/Ethnicity	Population 0-23 months [†]	Children tested*		Confirmed EBLL ≥ 3.5		
			N	% of population**	N	% of tested	% of population
Lackawanna	Non-Hispanic Black or African American	248	55	22.18	5	9.09	2.02
Lackawanna	Hispanic	836	210	25.12	9	4.29	1.08
Lackawanna	Non-Hispanic White	2,745	752	27.40	18	2.39	0.66
Lancaster	Non-Hispanic Black or African American	530	129	24.34	4	3.10	0.75
Lancaster	Hispanic	2,278	554	24.32	28	5.05	1.23
Lancaster	Non-Hispanic White	9,638	2,253	23.38	75	3.33	0.78
Lehigh	Non-Hispanic Black or African American	641	231	36.04	7	3.03	1.09
Lehigh	Hispanic	3,745	975	26.03	30	3.08	0.80
Lehigh	Non-Hispanic White	3,378	610	18.06	13	2.13	0.38
Luzerne	Non-Hispanic Black or African American	468	172	36.75	8	4.65	1.71
Luzerne	Hispanic	2,406	736	30.59	41	5.57	1.70
Luzerne	Non-Hispanic White	3,472	1,286	37.04	31	2.41	0.89
Montgomery	Non-Hispanic Black or African American	1,724	638	37.01	18	2.82	1.04
Montgomery	Hispanic	1,936	842	43.49	48	5.70	2.48
Montgomery	Non-Hispanic White	11,078	3,143	28.37	45	1.43	0.41
Northampton	Non-Hispanic Black or African American	423	129	30.50	3	2.33	0.71
Northampton	Hispanic	1,573	253	16.08	15	5.93	0.95
Northampton	Non-Hispanic White	3,321	855	25.75	21	2.46	0.63
Philadelphia	Non-Hispanic Black or African American	14,035	5,914	42.14	364	6.15	2.59
Philadelphia	Hispanic	9,225	3,195	34.63	128	4.01	1.39
Philadelphia	Non-Hispanic White	8,810	4,020	45.63	86	2.14	0.98
Westmoreland	Non-Hispanic Black or African American	274	109	39.78	2	1.83	0.73
Westmoreland	Hispanic	175	38	21.71	0	0.00	0.00
Westmoreland	Non-Hispanic White	4,996	2,320	46.44	37	1.59	0.74

County of residence	Race/Ethnicity	Population 0-23 months [†]	Children tested*		Confirmed EBLL \geq 3.5		
			N	% of population**	N	% of tested	% of population
York	Non-Hispanic Black or African American	712	163	22.89	10	6.13	1.40
York	Hispanic	1,644	391	23.78	23	5.88	1.40
York	Non-Hispanic White	6,557	1,399	21.34	38	2.72	0.58
Pennsylvania Total	Non-Hispanic Black or African American	34,232	13,255	38.72	613	4.62	1.79
Pennsylvania Total	Hispanic	41,277	12,208	29.58	581	4.76	1.41
Pennsylvania Total	Non-Hispanic White	160,853	51,977	32.31	1,264	2.43	0.79
Pennsylvania Total		261,569	90,886	34.75	2,834	3.12	1.08

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny and Philadelphia are currently the only counties with mandatory testing.

**Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

****Per CDC 2016 Elevated Blood Lead case definition

†estimated from 2022 intercensal estimate

Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Table 12: Number of Children with Confirmed EBLI* by County of Residence and Race/Ethnicity, Children Aged 0–71 Months, for Select Counties, 2022**

County of residence	Race/Ethnicity	Population 0-71 months†	Children tested*		Confirmed EBLI ≥ 3.5		
			N	% of population**	N	% of tested	% of population
Allegheny	Non-Hispanic Black or African American	14,021	3,567	25.44	261	7.32	1.86
Allegheny	Hispanic	2,749	458	16.66	31	6.77	1.13
Allegheny	Non-Hispanic White	47,760	12,194	25.53	211	1.73	0.44
Berks	Non-Hispanic Black or African American	1,310	273	20.84	34	12.45	2.6
Berks	Hispanic	12,040	2,324	19.3	287	12.35	2.38
Berks	Non-Hispanic White	13,592	1,528	11.24	127	8.31	0.93
Bucks	Non-Hispanic Black or African American	1,918	244	12.72	1	0.41	0.05
Bucks	Hispanic	4,066	588	14.46	7	1.19	0.17
Bucks	Non-Hispanic White	25,620	1,883	7.35	21	1.12	0.08
Chester	Non-Hispanic Black or African American	1,815	423	23.31	11	2.60	0.61
Chester	Hispanic	4,978	1,373	27.58	56	4.08	1.12
Chester	Non-Hispanic White	23,366	2,858	12.23	30	1.05	0.13
Cumberland	Non-Hispanic Black or African American	1,122	185	16.49	5	2.70	0.45
Cumberland	Hispanic	1,505	158	10.5	5	3.16	0.33
Cumberland	Non-Hispanic White	11,993	1,379	11.5	37	2.68	0.31
Dauphin	Non-Hispanic Black or African American	3,872	966	24.95	47	4.87	1.21
Dauphin	Hispanic	4,239	719	16.96	39	5.42	0.92
Dauphin	Non-Hispanic White	9,070	1,537	16.95	34	2.21	0.37
Delaware	Non-Hispanic Black or African American	10,843	2,959	27.29	125	4.22	1.15
Delaware	Hispanic	3,611	1,093	30.27	36	3.29	1.00
Delaware	Non-Hispanic White	19,852	3,804	19.16	50	1.31	0.25
Erie	Non-Hispanic Black or African American	2,057	478	23.24	43	9.00	2.09
Erie	Hispanic	1,767	230	13.02	18	7.83	1.02
Erie	Non-Hispanic White	11,032	2,192	19.87	73	3.33	0.66
Lackawanna	Non-Hispanic Black or African American	770	132	17.14	22	16.67	2.86
Lackawanna	Hispanic	2,594	382	14.73	30	7.85	1.16
Lackawanna	Non-Hispanic White	8,522	1,124	13.19	49	4.36	0.57

County of residence	Race/Ethnicity	Population 0-71 months [†]	Children tested*		Confirmed EBLL <u>>3. 5</u>		
			N	% of population**	N	% of tested	% of population
Lancaster	Non-Hispanic Black or African American	1,646	243	14.76	22	9.05	1.34
Lancaster	Hispanic	7,074	1,211	17.12	83	6.85	1.17
Lancaster	Non-Hispanic White	29,927	4,432	14.81	141	3.18	0.47
Lehigh	Non-Hispanic Black or African American	1,991	441	22.15	23	5.22	1.16
Lehigh	Hispanic	11,627	1,740	14.97	86	4.94	0.74
Lehigh	Non-Hispanic White	10,487	1,081	10.31	34	3.15	0.32
Luzerne	Non-Hispanic Black or African American	1,452	386	26.58	36	9.33	2.48
Luzerne	Hispanic	7,470	1,430	19.14	93	6.50	1.24
Luzerne	Non-Hispanic White	10,781	2,100	19.48	93	4.43	0.86
Montgomery	Non-Hispanic Black or African American	5,354	1,163	21.72	45	3.87	0.84
Montgomery	Hispanic	6,011	1,512	25.15	104	6.88	1.73
Montgomery	Non-Hispanic White	34,396	5,108	14.85	67	1.31	0.19
Northampton	Non-Hispanic Black or African American	1,314	245	18.65	8	3.27	0.61
Northampton	Hispanic	4,885	504	10.32	34	6.75	0.70
Northampton	Non-Hispanic White	10,311	1,399	13.57	32	2.29	0.31
Philadelphia	Non-Hispanic Black or African American	43,581	11,819	27.12	1,250	10.58	2.87
Philadelphia	Hispanic	28,644	6,052	21.13	323	5.34	1.13
Philadelphia	Non-Hispanic White	27,354	6,331	23.14	154	2.43	0.56
Westmoreland	Non-Hispanic Black or African American	849	237	27.92	17	7.17	2.00
Westmoreland	Hispanic	545	59	10.83	1	1.69	0.18
Westmoreland	Non-Hispanic White	15,511	3,696	23.83	67	1.81	0.43
York	Non-Hispanic Black or African American	2,210	280	12.67	23	8.21	1.04
York	Hispanic	5,105	622	12.18	49	7.88	0.96
York	Non-Hispanic White	20,360	2,034	9.99	65	3.20	0.32
Pennsylvania Total	Non-Hispanic Black or African American	103,836	25,725	24.77	2,073	8.06	2.00
Pennsylvania Total	Hispanic	124,144	22,698	18.28	1,452	6.40	1.17
Pennsylvania Total	Non-Hispanic White	507,585	85,048	16.76	2,676	3.15	0.53
Pennsylvania Total		812,182	160,177	19.72	7,332	4.57	1.61

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny and Philadelphia are currently the only counties with mandatory testing.

**Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

***Per CDC 2016 Elevated Blood Lead case definition

†estimated from 2022 intercensal estimate

Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Testing Summaries by County:

The following are summaries of children under age 2 and under age 6 tested by county, including the number of children tested, the percent of the population tested, and BLLs of 3.5–9.9 and ≥ 10 $\mu\text{g}/\text{dL}$ by maximum blood level and by confirmed blood level for all 67 counties.

Table 13: Number of Children Tested for Lead by Maximum Blood Lead Level and County of Residence, Children Aged 0–23 Months, 202

County of residence	Population of children aged 0–23 months [†]	Children tested*		Maximum BLL 3.5–9.9 $\mu\text{g}/\text{dL}$			Maximum BLL ≥ 10 $\mu\text{g}/\text{dL}$		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Adams	1,868	804	43.04	25	3.11	1.34	3	0.37	0.16
Allegheny	23,805	11,293	47.44	452	4.00	1.90	57	0.50	0.24
Armstrong	1,131	472	41.73	18	3.81	1.59	1	0.21	0.09
Beaver	3,036	1,337	44.04	59	4.41	1.94	10	0.75	0.33
Bedford	927	349	37.65	11	3.15	1.19	1	0.29	0.11
Berks	9,078	2,795	30.79	289	10.34	3.18	73	2.61	0.80
Blair	2,304	995	43.19	67	6.73	2.91	19	1.91	0.82
Bradford	1,270	477	37.56	38	7.97	2.99	8	1.68	0.63
Bucks	11,550	2,120	18.35	30	1.42	0.26	2	0.09	0.02
Butler	3,614	1,663	46.02	43	2.59	1.19	4	0.24	0.11
Cambria	2,380	969	40.71	50	5.16	2.10	11	1.14	0.46
Cameron	66	21	31.82	0	0.00	0.00	0	0.00	0.00
Carbon	1,166	292	25.04	16	5.48	1.37	5	1.71	0.43
Centre	2,151	550	25.57	12	2.18	0.56	2	0.36	0.09
Chester	11,205	3,271	29.19	91	2.78	0.81	7	0.21	0.06
Clarion	694	200	28.82	10	5.00	1.44	1	0.50	0.14
Clearfield	1,351	477	35.31	10	2.10	0.74	4	0.84	0.30
Clinton	785	197	25.10	10	5.08	1.27	2	1.02	0.25
Columbia	1,073	243	22.65	8	3.29	0.75	4	1.65	0.37
Crawford	1,669	503	30.14	12	2.39	0.72	6	1.19	0.36
Cumberland	5,464	1,559	28.53	50	3.21	0.92	9	0.58	0.16
Dauphin	6,602	2,754	41.71	129	4.68	1.95	15	0.54	0.23

County of residence	Population of children aged 0–23 months†	Children tested*		Maximum BLL 3.5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Delaware	12,583	5,060	40.21	144	2.85	1.14	11	0.22	0.09
Elk	534	209	39.14	16	7.66	3.00	4	1.91	0.75
Erie	5,344	1,937	36.25	109	5.63	2.04	23	1.19	0.43
Fayette	2,418	827	34.20	44	5.32	1.82	6	0.73	0.25
Forest	28	14	50.00	3	21.43	10.71	0	0.00	0.00
Franklin	3,313	1,075	32.45	41	3.81	1.24	7	0.65	0.21
Fulton	267	82	30.71	2	2.44	0.75	0	0.00	0.00
Greene	635	178	28.03	7	3.93	1.10	4	2.25	0.63
Huntingdon	751	279	37.15	24	8.60	3.20	4	1.43	0.53
Indiana	1,486	594	39.97	25	4.21	1.68	7	1.18	0.47
Jefferson	910	289	31.76	17	5.88	1.87	6	2.08	0.66
Juniata	553	123	22.24	8	6.50	1.45	2	1.63	0.36
Lackawanna	4,199	1,151	27.41	65	5.65	1.55	16	1.39	0.38
Lancaster	13,318	3,267	24.53	153	4.68	1.15	30	0.92	0.23
Lawrence	1,641	654	39.85	24	3.67	1.46	7	1.07	0.43
Lebanon	3,111	772	24.82	46	5.96	1.48	5	0.65	0.16
Lehigh	8,376	2,209	26.37	126	5.70	1.50	13	0.59	0.16
Luzerne	6,699	2,398	35.80	158	6.59	2.36	25	1.04	0.37
Lycoming	2,306	586	25.41	27	4.61	1.17	6	1.02	0.26
McKean	688	250	36.34	15	6.00	2.18	5	2.00	0.73
Mercer	2,055	749	36.45	38	5.07	1.85	4	0.53	0.19
Mifflin	1,129	264	23.38	16	6.06	1.42	3	1.14	0.27
Monroe	2,940	476	16.19	17	3.57	0.58	1	0.21	0.03
Montgomery	17,393	5,407	31.09	167	3.09	0.96	31	0.57	0.18
Montour	388	132	34.02	4	3.03	1.03	1	0.76	0.26
Northampton	5,766	1,555	26.97	80	5.14	1.39	6	0.39	0.10
Northumberland	1,735	538	31.01	44	8.18	2.54	8	1.49	0.46
Perry	929	249	26.80	13	5.22	1.40	4	1.61	0.43

County of residence	Population of children aged 0–23 months [†]	Children tested*		Maximum BLL 3.5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Philadelphia	36,273	16,141	44.50	795	4.93	2.19	111	0.69	0.31
Potter	925	149	16.11	3	2.01	0.32	0	0.00	0.00
Schuylkill	316	121	38.29	2	1.65	0.63	1	0.83	0.32
Snyder	2,633	1,055	40.07	75	7.11	2.85	14	1.33	0.53
Somerset	796	167	20.98	8	4.79	1.01	1	0.60	0.13
Sullivan	1,320	434	32.88	16	3.69	1.21	2	0.46	0.15
Susquehanna	61	35	57.38	3	8.57	4.92	1	2.86	1.64
Tioga	696	143	20.55	5	3.50	0.72	1	0.70	0.14
Union	781	192	24.58	11	5.73	1.41	5	2.60	0.64
Venango	757	137	18.10	6	4.38	0.79	1	0.73	0.13
Warren	888	323	36.37	25	7.74	2.82	5	1.55	0.56
Washington	738	315	42.68	26	8.25	3.52	7	2.22	0.95
Wayne	4,047	1,743	43.07	72	4.13	1.78	11	0.63	0.27
Westmoreland	814	257	31.57	7	2.72	0.86	0	0.00	0.00
Wyoming	5,823	2,734	46.95	90	3.29	1.55	20	0.73	0.34
York	463	86	18.57	7	8.14	1.51	0	0.00	0.00
Total	9,555	2,189	22.91	110	5.03	1.15	24	1.10	0.25

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.

**Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

†2019 intercensal estimate

Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Table 14: Number of Children Aged 0–23 Months by County of Residence and Elevated Blood Lead Confirmation Status,* 2022

County of residence	Population of children aged 0–23 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)		Confirmed ≥ 3.5-4.9 µg/dL		Confirmed ≥ 5-9.9 µg/dL		Confirmed ≥ 10 µg/dL	
		N	% of population [^]	N	% of tested	N	% of tested	N	% of tested	N	% of tested
Adams	1,868	804	43.04	14	1.74	5	0.62	5	0.62	3	0.37
Allegheny	23,805	11,296	47.45	225	1.99	110	0.97	113	1.00	40	0.35
Armstrong	1,131	471	41.64	9	1.91	3	0.64	6	1.27	0	0.00
Beaver	3,036	1,338	44.07	36	2.69	7	0.52	15	1.12	4	0.30
Bedford	927	348	37.54	4	1.15	3	0.86	3	0.86	1	0.29
Berks	9,078	2,796	30.80	107	3.83	75	2.68	124	4.43	55	1.97
Blair	2,304	998	43.32	27	2.71	12	1.20	29	2.91	13	1.30
Bradford	1,270	477	37.56	7	1.47	13	2.73	18	3.77	6	1.26
Bucks	11,550	2,123	18.38	12	0.57	4	0.19	15	0.71	1	0.05
Butler	3,614	1,664	46.04	30	1.80	7	0.42	9	0.54	0	0.00
Cambria	2,380	968	40.67	25	2.58	9	0.93	16	1.65	6	0.62
Cameron	66	21	31.82	0	0.00	0	0.00	0	0.00	0	0.00
Carbon	1,166	293	25.13	9	3.07	2	0.68	3	1.02	4	1.37
Centre	2,151	551	25.62	3	0.54	6	1.09	4	0.73	1	0.18
Chester	11,205	3,270	29.18	40	1.22	25	0.76	27	0.83	4	0.12
Clarion	694	201	28.96	7	3.48	3	1.49	1	0.50	0	0.00
Clearfield	1,351	477	35.31	6	1.26	1	0.21	5	1.05	1	0.21
Clinton	785	198	25.22	3	1.52	2	1.01	5	2.53	2	1.01
Columbia	1,073	243	22.65	4	1.65	4	1.65	1	0.41	4	1.65
Crawford	1,669	502	30.08	8	1.59	3	0.60	2	0.40	5	1.00
Cumberland	5,464	1,557	28.50	20	1.28	14	0.90	12	0.77	6	0.39
Dauphin	6,602	2,739	41.49	85	3.10	18	0.66	25	0.91	8	0.29
Delaware	12,583	5,059	40.21	71	1.40	37	0.73	32	0.63	9	0.18
Elk	534	209	39.14	8	3.83	3	1.44	6	2.87	3	1.44
Erie	5,344	1,936	36.23	62	3.20	21	1.08	28	1.45	17	0.88

County of residence	Population of children aged 0–23 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)		Confirmed ≥ 3.5-4.9 µg/dL		Confirmed ≥ 5-9.9 µg/dL		Confirmed ≥ 10 µg/dL	
		N	% of population [^]	N	% of tested	N	% of tested	N	% of tested	N	% of tested
Fayette	2,418	832	34.41	30	3.61	9	1.08	5	0.60	6	0.72
Forest	28	14	50.00	0	0.00	2	14.29	1	7.14	0	0.00
Franklin	3,313	1,075	32.45	13	1.21	16	1.49	11	1.02	6	0.56
Fulton	267	82	30.71	0	0.00	1	1.22	1	1.22	0	0.00
Greene	635	178	28.03	4	2.25	2	1.12	2	1.12	3	1.69
Huntingdon	751	277	36.88	19	6.86	7	2.53	2	0.72	1	0.36
Indiana	1,486	594	39.97	17	2.86	6	1.01	10	1.68	2	0.34
Jefferson	910	289	31.76	9	3.11	7	2.42	3	1.04	3	1.04
Juniata	553	123	22.24	2	1.63	3	2.44	4	3.25	2	1.63
Lackawanna	4,199	1,153	27.46	48	4.16	14	1.21	18	1.56	7	0.61
Lancaster	13,318	3,270	24.55	56	1.71	41	1.25	60	1.83	26	0.80
Lawrence	1,641	656	39.98	18	2.74	4	0.61	7	1.07	5	0.76
Lebanon	3,111	776	24.94	23	2.96	10	1.29	14	1.80	4	0.52
Lehigh	8,376	2,204	26.31	84	3.81	20	0.91	22	1.00	11	0.50
Luzerne	6,699	2,398	35.80	91	3.79	38	1.58	39	1.63	14	0.58
Lycoming	2,306	586	25.41	10	1.71	12	2.05	10	1.71	2	0.34
McKean	688	250	36.34	6	2.40	2	0.80	6	2.40	5	2.00
Mercer	2,055	751	36.55	18	2.40	7	0.93	15	2.00	3	0.40
Mifflin	1,129	264	23.38	2	0.76	9	3.41	6	2.27	3	1.14
Monroe	2,940	476	16.19	7	1.47	0	0.00	9	1.89	1	0.21
Montgomery	17,393	5,407	31.09	70	1.29	32	0.59	63	1.17	29	0.54
Montour	388	132	34.02	2	1.52	1	0.76	1	0.76	1	0.76
Northampton	5,766	1,558	27.02	46	2.95	13	0.83	22	1.41	4	0.26
Northumberland	1,735	540	31.12	8	1.48	16	2.96	23	4.26	7	1.30
Perry	929	251	27.02	8	3.19	1	0.40	5	1.99	4	1.59
Philadelphia	36,273	16,141	44.50	233	1.44	294	1.82	284	1.76	95	0.59
Pike	925	149	16.11	1	0.67	1	0.67	1	0.67	0	0.00

County of residence	Population of children aged 0–23 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)		Confirmed ≥ 3.5-4.9 µg/dL		Confirmed ≥ 5-9.9 µg/dL		Confirmed 10 µg/dL	
		N	% of population [^]	N	% of tested	N	% of tested	N	% of tested	N	% of tested
Potter	316	122	38.61	0	0.00	1	0.82	1	0.82	2	1.64
Schuylkill	2,633	1,053	39.99	34	3.23	24	2.28	16	1.52	11	1.04
Snyder	796	168	21.11	3	1.79	1	0.60	2	1.19	1	0.60
Somerset	1,320	434	32.88	11	2.53	4	0.92	2	0.46	0	0.00
Sullivan	61	35	57.38	1	2.86	1	2.86	1	2.86	1	2.86
Susquehanna	696	143	20.55	1	0.70	3	2.10	2	1.40	1	0.70
Tioga	781	191	24.46	4	2.09	5	2.62	2	1.05	4	2.09
Union	757	136	17.97	0	0.00	1	0.74	5	3.68	1	0.74
Venango	888	322	36.26	7	2.17	6	1.86	11	3.42	4	1.24
Warren	738	315	42.68	8	2.54	7	2.22	9	2.86	6	1.90
Washington	4,047	1,740	42.99	53	3.05	11	0.63	11	0.63	7	0.40
Wayne	814	257	31.57	5	1.95	0	0.00	1	0.39	0	0.00
Westmoreland	5,823	2,728	46.85	63	2.31	14	0.51	15	0.55	12	0.44
Wyoming	463	86	18.57	4	4.65	0	0.00	3	3.49	0	0.00
York	9,555	2,191	22.93	48	2.19	31	1.41	39	1.78	15	0.68
Total	261,569	90,886	34.75	1,889	2.08	1,064	1.17	1,268	1.40	502	0.55

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months.

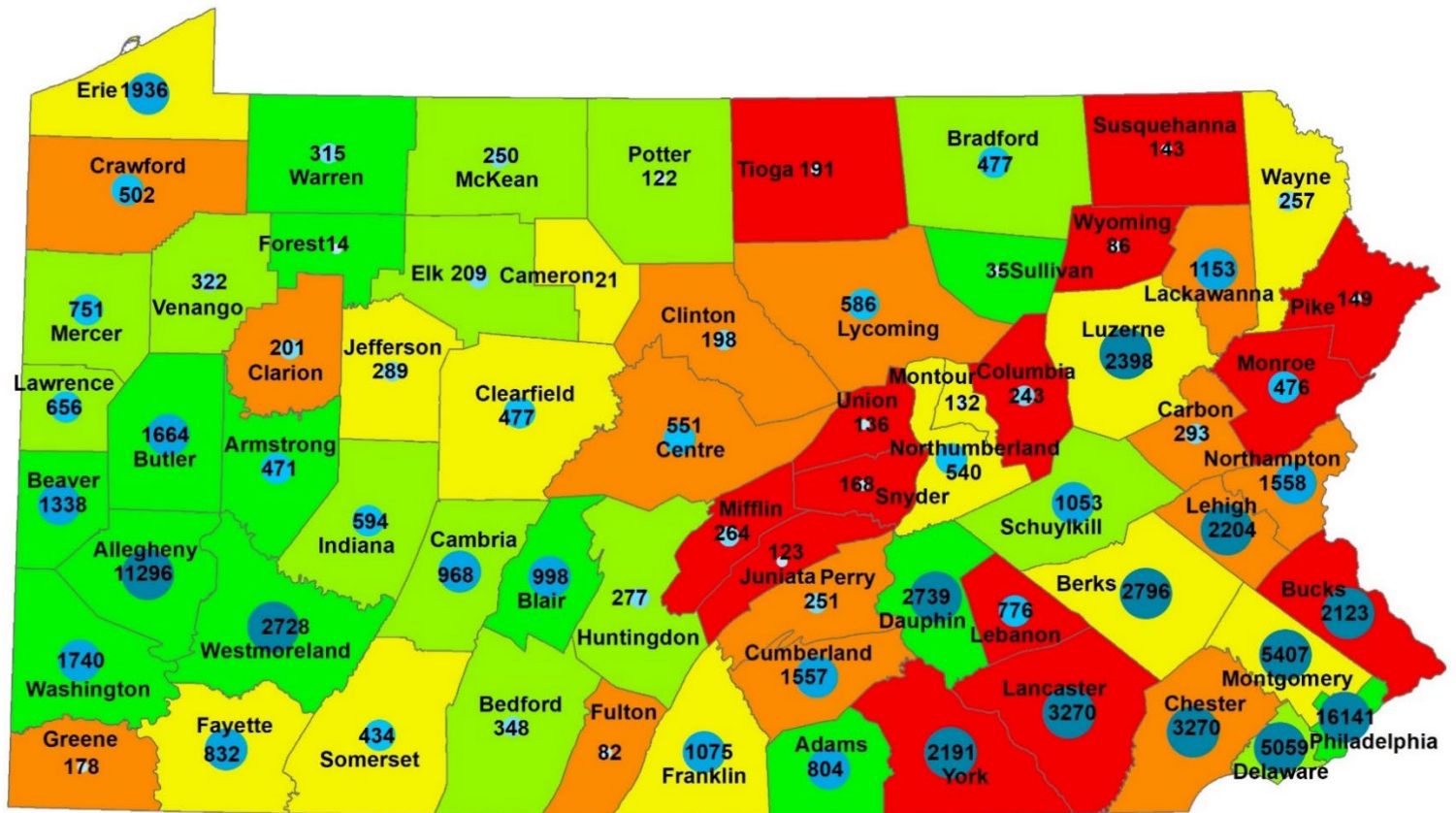
Allegheny County is currently the only county with mandatory testing.

[^]Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

[†]estimated from 2022 intercensal estimate

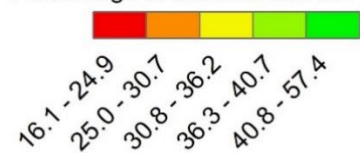
Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Figure 1: Number and Percentage* of Children Aged 0–23 Months Tested for Blood Lead Level by County, 2022

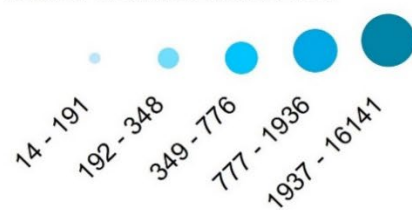


Data Sources: Pennsylvania's Electronic Reportable Disease Surveillance System and U.S. Census Bureau

Percentage of children with BLL test

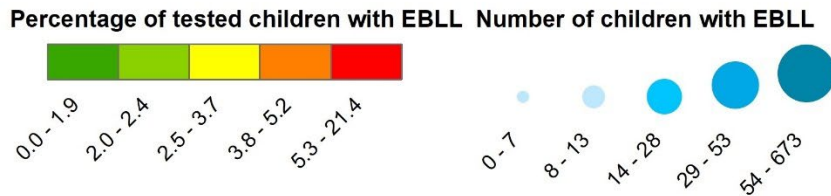
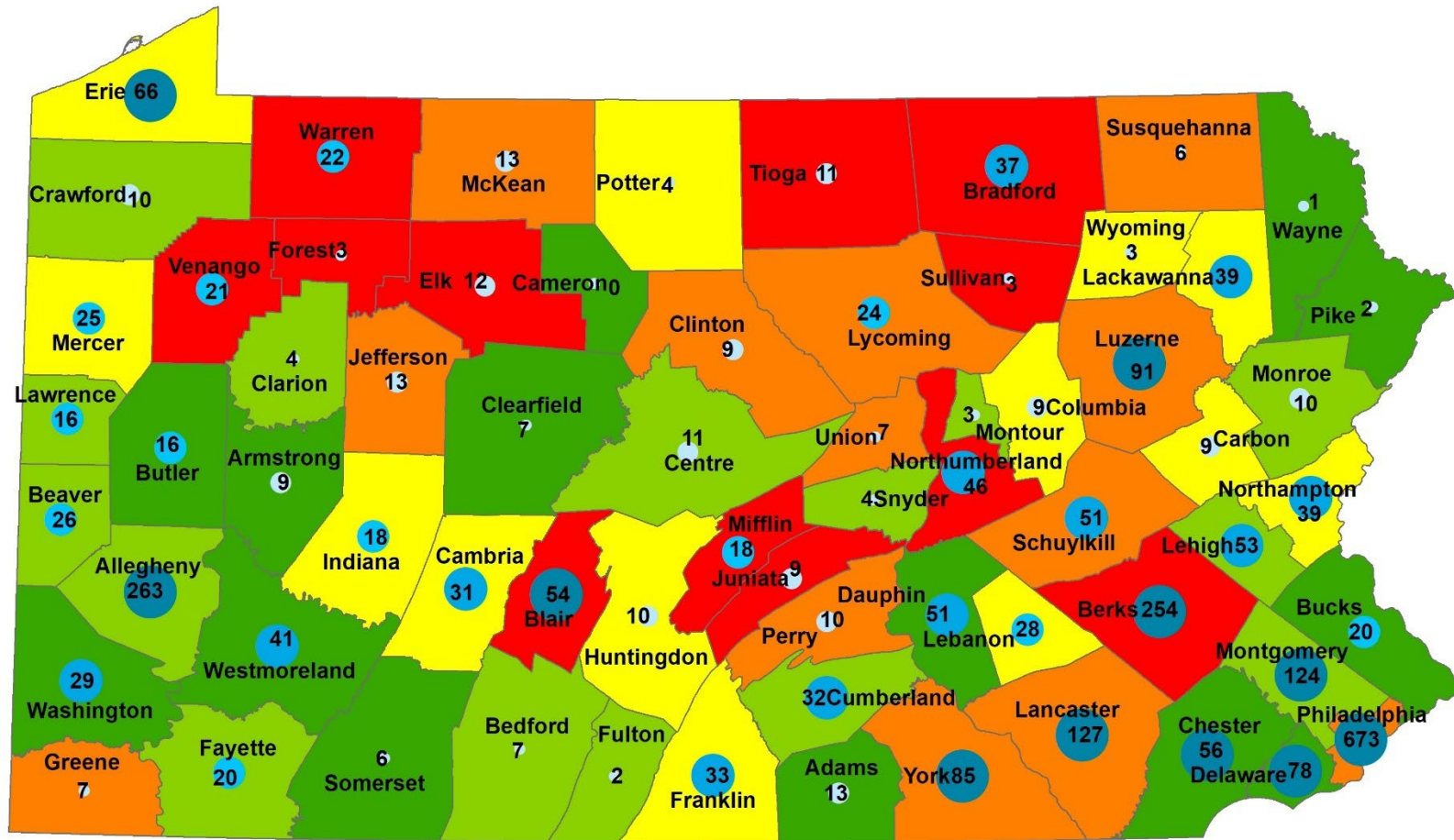


Number of children with BLL test



*Percentage was calculated by dividing the number of children aged 0–23 months tested in each county by the 2019 intercensal estimate of the number of children aged 0–23 months residing in the county.

Figure 2: Number and Percentage* of Children Aged 0–23 Months with Confirmed Elevated Blood Lead Level by County, 2022



Data Sources: Pennsylvania's Electronic Reportable Disease Surveillance System and U.S. Census Bureau

*Percentage was calculated by dividing the number of children aged 0–23 months with EBLL by the total number of children aged 0–23 months tested for blood lead level in 2022.

Table 15: Number of Children Tested for Lead by Maximum Blood Lead Level and County of Residence, Children Aged 0–71 Months, 2022

County of residence	Population of children aged 0–71 months [†]	Children tested*		Maximum BLL 3.5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Adams	5,801	1,166	20.10	41	3.52	0.71	6	0.51	0.10
Allegheny	73,916	19,948	26.99	1,032	5.17	1.40	167	0.84	0.23
Armstrong	3,512	942	26.82	47	4.99	1.34	3	0.32	0.09
Beaver	9,427	1,988	21.09	106	5.33	1.12	14	0.70	0.15
Bedford	2,877	618	21.48	33	5.34	1.15	4	0.65	0.14
Berks	28,189	5,151	18.27	682	13.24	2.42	143	2.78	0.51
Blair	7,154	1,517	21.20	163	10.74	2.28	46	3.03	0.64
Bradford	3,942	912	23.14	87	9.54	2.21	14	1.54	0.36
Bucks	35,863	3,437	9.58	62	1.80	0.17	6	0.17	0.02
Butler	11,223	2,580	22.99	70	2.71	0.62	9	0.35	0.08
Cambria	7,388	1,543	20.89	123	7.97	1.66	26	1.69	0.35
Cameron	206	48	23.30	2	4.17	0.97	1	2.08	0.49
Carbon	3,620	565	15.61	71	12.57	1.96	14	2.48	0.39
Centre	6,679	670	10.03	20	2.99	0.30	3	0.45	0.04
Chester	34,791	5,665	16.28	196	3.46	0.56	21	0.37	0.06
Clarion	2,154	326	15.13	19	5.83	0.88	2	0.61	0.09
Clearfield	4,196	785	18.71	33	4.20	0.79	5	0.64	0.12
Clinton	2,437	299	12.27	22	7.36	0.90	3	1.00	0.12
Columbia	3,331	434	13.03	23	5.30	0.69	8	1.84	0.24
Crawford	5,183	982	18.95	78	7.94	1.50	17	1.73	0.33
Cumberland	16,967	2,303	13.57	102	4.43	0.60	14	0.61	0.08
Dauphin	20,498	4,635	22.61	295	6.36	1.44	42	0.91	0.20
Delaware	39,072	9,032	23.12	402	4.45	1.03	48	0.53	0.12
Elk	1,659	334	20.13	24	7.19	1.45	5	1.50	0.30
Erie	16,594	3,578	21.56	291	8.13	1.75	57	1.59	0.34
Fayette	7,509	1,434	19.10	101	7.04	1.35	16	1.12	0.21

County of residence	Population of children aged 0–71 months†	Children tested*		Maximum BLL 3.5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Forest	86	27	31.40	4	14.81	4.65	0	0.00	0.00
Franklin	10,288	1,865	18.13	90	4.83	0.87	17	0.91	0.17
Fulton	830	153	18.43	5	3.27	0.60	0	0.00	0.00
Greene	1,971	348	17.66	26	7.47	1.32	8	2.30	0.41
Huntingdon	2,333	458	19.63	41	8.95	1.76	4	0.87	0.17
Indiana	4,615	900	19.50	44	4.89	0.95	13	1.44	0.28
Jefferson	2,825	483	17.10	34	7.04	1.20	5	1.04	0.18
Juniata	1,716	202	11.77	14	6.93	0.82	3	1.49	0.17
Lackawanna	13,039	1,915	14.69	180	9.40	1.38	46	2.40	0.35
Lancaster	41,354	6,726	16.26	357	5.31	0.86	72	1.07	0.17
Lawrence	5,095	1,236	24.26	64	5.18	1.26	13	1.05	0.26
Lebanon	9,661	1,458	15.09	113	7.75	1.17	21	1.44	0.22
Lehigh	26,007	4,122	15.85	301	7.30	1.16	49	1.19	0.19
Luzerne	20,799	4,299	20.67	360	8.37	1.73	80	1.86	0.38
Lycoming	7,160	925	12.92	60	6.49	0.84	15	1.62	0.21
McKean	2,136	515	24.11	35	6.80	1.64	6	1.17	0.28
Mercer	6,381	1,299	20.36	87	6.70	1.36	12	0.92	0.19
Mifflin	3,505	433	12.35	30	6.93	0.86	4	0.92	0.11
Monroe	9,130	846	9.27	24	2.84	0.26	2	0.24	0.02
Montgomery	54,006	9,250	17.13	337	3.64	0.62	59	0.64	0.11
Montour	1,205	206	17.10	10	4.85	0.83	2	0.97	0.17
Northampton	17,902	2,723	15.21	163	5.99	0.91	23	0.84	0.13
Northumberland	5,387	851	15.80	81	9.52	1.50	21	2.47	0.39
Perry	2,884	391	13.56	21	5.37	0.73	7	1.79	0.24
Philadelphia	112,630	30,521	27.10	2,216	7.26	1.97	341	1.12	0.30
Pike	2,871	320	11.15	7	2.19	0.24	1	0.31	0.03
Potter	981	253	25.79	13	5.14	1.33	1	0.40	0.10
Schuylkill	8,175	2,025	24.77	202	9.98	2.47	34	1.68	0.42

County of residence	Population of children aged 0–71 months [†]	Children tested*		Maximum BLL 3.5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Snyder	2,471	270	10.93	11	4.07	0.45	3	1.11	0.12
Somerset	4,097	647	15.79	32	4.95	0.78	5	0.77	0.12
Sullivan	190	55	28.95	4	7.27	2.11	1	1.82	0.53
Susquehanna	2,160	247	11.44	11	4.45	0.51	3	1.21	0.14
Tioga	2,425	320	13.20	17	5.31	0.70	7	2.19	0.29
Union	2,351	221	9.40	11	4.98	0.47	2	0.90	0.09
Venango	2,756	677	24.56	76	11.23	2.76	12	1.77	0.44
Warren	2,291	554	24.18	57	10.29	2.49	14	2.53	0.61
Washington	12,565	2,948	23.46	145	4.92	1.15	21	0.71	0.17
Wayne	2,527	547	21.65	18	3.29	0.71	4	0.73	0.16
Westmoreland	18,079	4,492	24.85	180	4.01	1.00	33	0.73	0.18
Wyoming	1,438	161	11.20	12	7.45	0.83	0	0.00	0.00
York	29,668	3,396	11.45	205	6.04	0.69	45	1.33	0.15
Total	812,182	160,177	19.72	9,823	6.13	1.21	1,703	1.06	0.21

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny and Philadelphia are currently the only counties with mandatory testing.

**Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

†estimate based on 2022 intercensal estimate

Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Table 16: Number of Children Aged 0–71 Months by County of Residence and Elevated Blood Lead Confirmation Status,* 2022

County of residence	Population of children aged 0–71 months [†]	Children tested**		Unconfirmed elevated (≥ 3.5 µg/dL)		Confirmed 3.5–4.9 µg/dL		Confirmed ≥5-9.9 µg/dL		Confirmed ≥ 10 µg/dL	
		N	% of population [^]	N	% of tested	N	% of tested	N	% of tested	N	% of tested
Adams	5,801	1,166	20.10	21	1.80	10	0.86	11	0.94	5	0.43
Allegheny	73,916	19,953	26.99	538	2.70	255	1.28	279	1.40	110	0.55
Armstrong	3,512	941	26.79	26	2.76	14	1.49	9	0.96	1	0.11
Beaver	9,427	1,991	21.12	65	3.26	15	0.75	25	1.26	9	0.45
Bedford	2,877	616	21.41	15	2.44	10	1.62	11	1.79	2	0.32
Berks	28,189	5,155	18.29	256	4.97	189	3.67	281	5.45	110	2.13
Blair	7,154	1,521	21.26	76	5.00	29	1.91	70	4.60	32	2.10
Bradford	3,942	912	23.14	24	2.63	34	3.73	28	3.07	11	1.21
Bucks	35,863	3,441	9.59	30	0.87	9	0.26	24	0.70	3	0.09
Butler	11,223	2,581	23.00	46	1.78	9	0.35	18	0.70	5	0.19
Cambria	7,388	1,542	20.87	58	3.76	23	1.49	48	3.11	14	0.91
Cameron	206	48	23.30	0	0.00	2	4.17	0	0.00	1	2.08
Carbon	3,620	566	15.64	39	6.89	11	1.94	21	3.71	10	1.77
Centre	6,679	670	10.03	6	0.90	8	1.19	7	1.04	2	0.30
Chester	34,791	5,664	16.28	99	1.75	45	0.79	57	1.01	13	0.23
Clarion	2,154	327	15.18	10	3.06	8	2.45	3	0.92	1	0.31
Clearfield	4,196	786	18.73	14	1.78	11	1.40	11	1.40	2	0.25
Clinton	2,437	300	12.31	3	1.00	7	2.33	11	3.67	3	1.00
Columbia	3,331	434	13.03	8	1.84	6	1.38	10	2.30	8	1.84
Crawford	5,183	982	18.95	31	3.16	28	2.85	21	2.14	13	1.32
Cumberland	16,967	2,300	13.56	39	1.70	27	1.17	35	1.52	9	0.39
Dauphin	20,498	4,615	22.51	176	3.81	58	1.26	70	1.52	29	0.63
Delaware	39,072	9,030	23.11	194	2.15	108	1.20	106	1.17	42	0.47
Elk	1,659	334	20.13	12	3.59	5	1.50	8	2.40	4	1.20
Erie	16,594	3,578	21.56	151	4.22	59	1.65	98	2.74	37	1.03

County of residence	Population of children aged 0–71 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)		Confirmed 3.5–4.9 µg/dL		Confirmed ≥5-9.9 µg/dL		Confirmed ≥ 10 µg/dL	
		N	% of population [^]	N	% of tested	N	% of tested	N	% of tested	N	% of tested
Fayette	7,509	1,438	19.15	75	5.22	21	1.46	16	1.11	10	0.70
Forest	86	27	31.40	0	0.00	3	11.11	1	3.70	0	0.00
Franklin	10,288	1,868	18.16	31	1.66	29	1.55	29	1.55	15	0.80
Fulton	830	151	18.19	1	0.66	1	0.66	3	1.99	0	0.00
Greene	1,971	348	17.66	15	4.31	9	2.59	6	1.72	4	1.15
Huntingdon	2,333	458	19.63	28	6.11	11	2.40	7	1.53	1	0.22
Indiana	4,615	902	19.54	34	3.77	11	1.22	13	1.44	5	0.55
Jefferson	2,825	483	17.10	13	2.69	11	2.28	12	2.48	3	0.62
Juniata	1,716	202	11.77	4	1.98	5	2.48	6	2.97	3	1.49
Lackawanna	13,039	1,916	14.69	107	5.58	44	2.30	51	2.66	31	1.62
Lancaster	41,354	6,728	16.27	132	1.96	109	1.62	133	1.98	61	0.91
Lawrence	5,095	1,239	24.32	44	3.55	11	0.89	16	1.29	8	0.65
Lebanon	9,661	1,464	15.15	47	3.21	34	2.32	42	2.87	14	0.96
Lehigh	26,007	4,114	15.82	188	4.57	50	1.22	75	1.82	34	0.83
Luzerne	20,799	4,298	20.66	185	4.30	89	2.07	101	2.35	54	1.26
Lycoming	7,160	925	12.92	14	1.51	25	2.70	27	2.92	11	1.19
McKean	2,136	514	24.06	13	2.53	6	1.17	15	2.92	6	1.17
Mercer	6,381	1,297	20.33	36	2.78	20	1.54	33	2.54	10	0.77
Mifflin	3,505	432	12.33	2	0.46	17	3.94	12	2.78	4	0.93
Monroe	9,130	848	9.29	11	1.30	3	0.35	10	1.18	2	0.24
Montgomery	54,006	9,248	17.12	138	1.49	80	0.87	119	1.29	53	0.57
Montour	1,205	206	17.10	3	1.46	4	1.94	3	1.46	2	0.97
Northampton	17,902	2,729	15.24	110	4.03	28	1.03	34	1.25	16	0.59
Northumberland	5,387	853	15.83	14	1.64	25	2.93	47	5.51	20	2.34
Perry	2,884	392	13.59	15	3.83	2	0.51	5	1.28	7	1.79
Philadelphia	112,630	30,523	27.10	484	1.59	887	2.91	889	2.91	311	1.02

County of residence	Population of children aged 0–71 months [†]	Children tested**		Unconfirmed elevated (≥3.5 µg/dL)		Confirmed 3.5–4.9 µg/dL		Confirmed ≥5-9.9 µg/dL		Confirmed ≥ 10 µg/dL	
		N	% of tested	N	% of tested	N	% of tested	N	% of tested	N	% of tested
Pike	2,871	321	11.18	4	1.25	2	0.62	2	0.62	0	0.00
Potter	981	253	25.79	5	1.98	4	1.58	5	1.98	2	0.79
Schuylkill	8,175	2,021	24.72	66	3.27	63	3.12	76	3.76	29	1.43
Snyder	2,471	271	10.97	4	1.48	2	0.74	3	1.11	3	1.11
Somerset	4,097	645	15.74	19	2.95	6	0.93	8	1.24	2	0.31
Sullivan	190	55	28.95	2	3.64	1	1.82	1	1.82	1	1.82
Susquehanna	2,160	247	11.44	3	1.21	5	2.02	4	1.62	3	1.21
Tioga	2,425	320	13.20	7	2.19	7	2.19	3	0.94	6	1.88
Union	2,351	220	9.36	0	0.00	3	1.36	7	3.18	2	0.91
Venango	2,756	676	24.53	35	5.18	12	1.78	29	4.29	9	1.33
Warren	2,291	555	24.23	28	5.05	14	2.52	20	3.60	12	2.16
Washington	12,565	2,941	23.41	96	3.26	26	0.88	28	0.95	12	0.41
Wayne	2,527	546	21.61	16	2.93	3	0.55	2	0.37	1	0.18
Westmoreland	18,079	4,487	24.82	120	2.67	26	0.58	39	0.87	22	0.49
Wyoming	1,438	161	11.20	5	3.11	1	0.62	7	4.35	0	0.00
York	29,668	3,402	11.47	74	2.18	68	2.00	73	2.15	35	1.03
Total	812,182	160,177	19.72	4,165	2.60	2,758	1.72	3,274	2.04	1,300	0.81

*Per CDC 2016 Confirmed Elevated Blood Lead case definition

**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months.

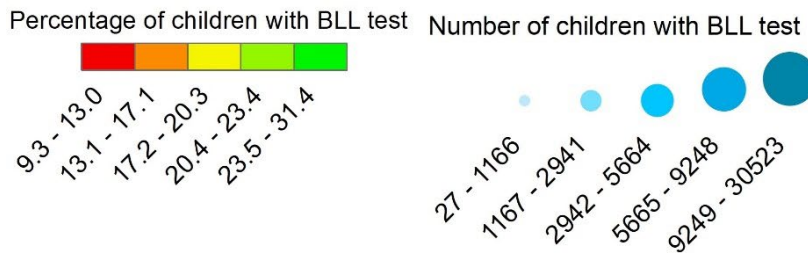
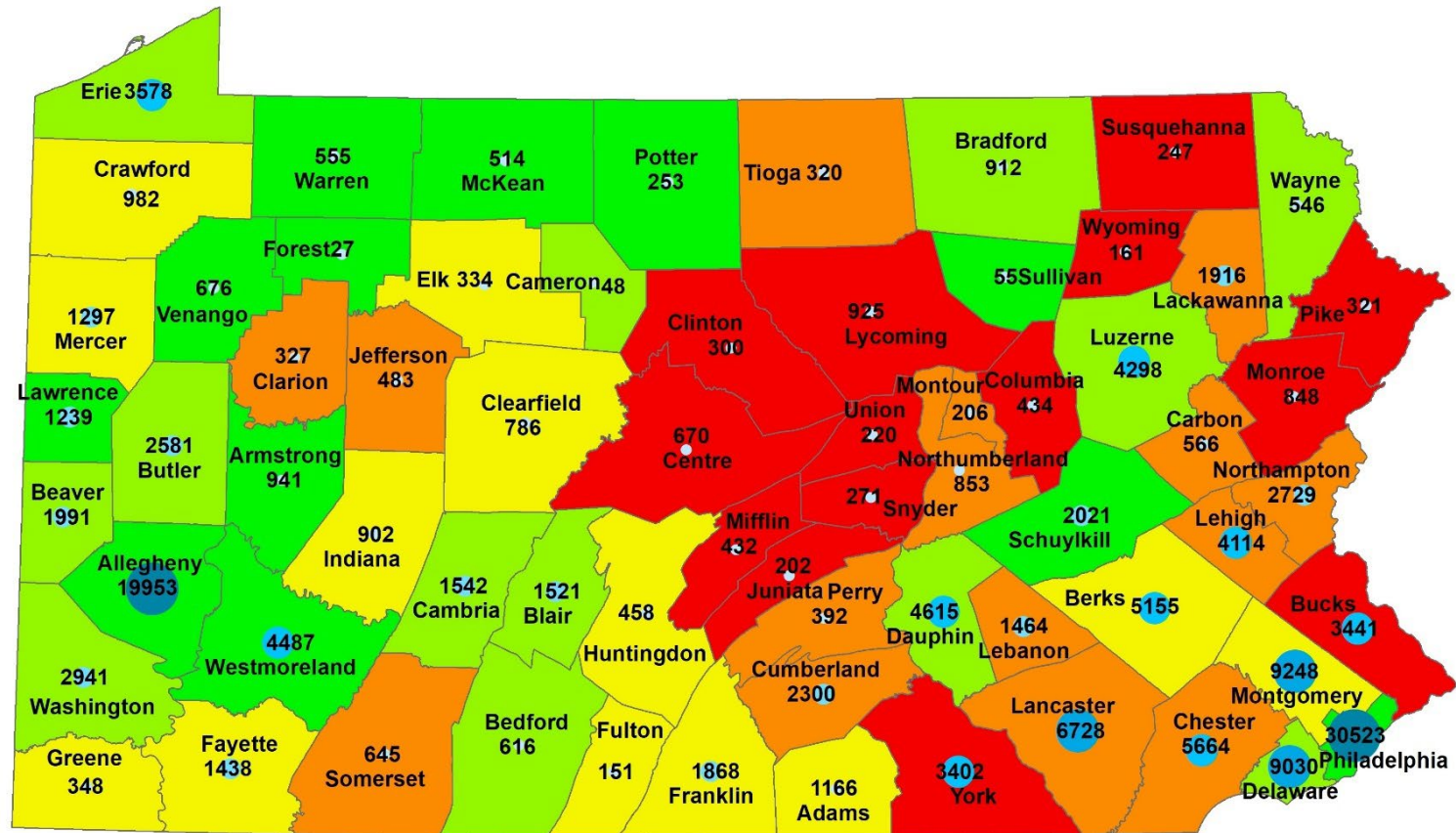
Allegheny and Philadelphia are currently the only counties with mandatory testing.

^Percent was calculated as the number of children tested divided by the population of children in the county for the specified age range.

†2020 intercensal estimate

Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

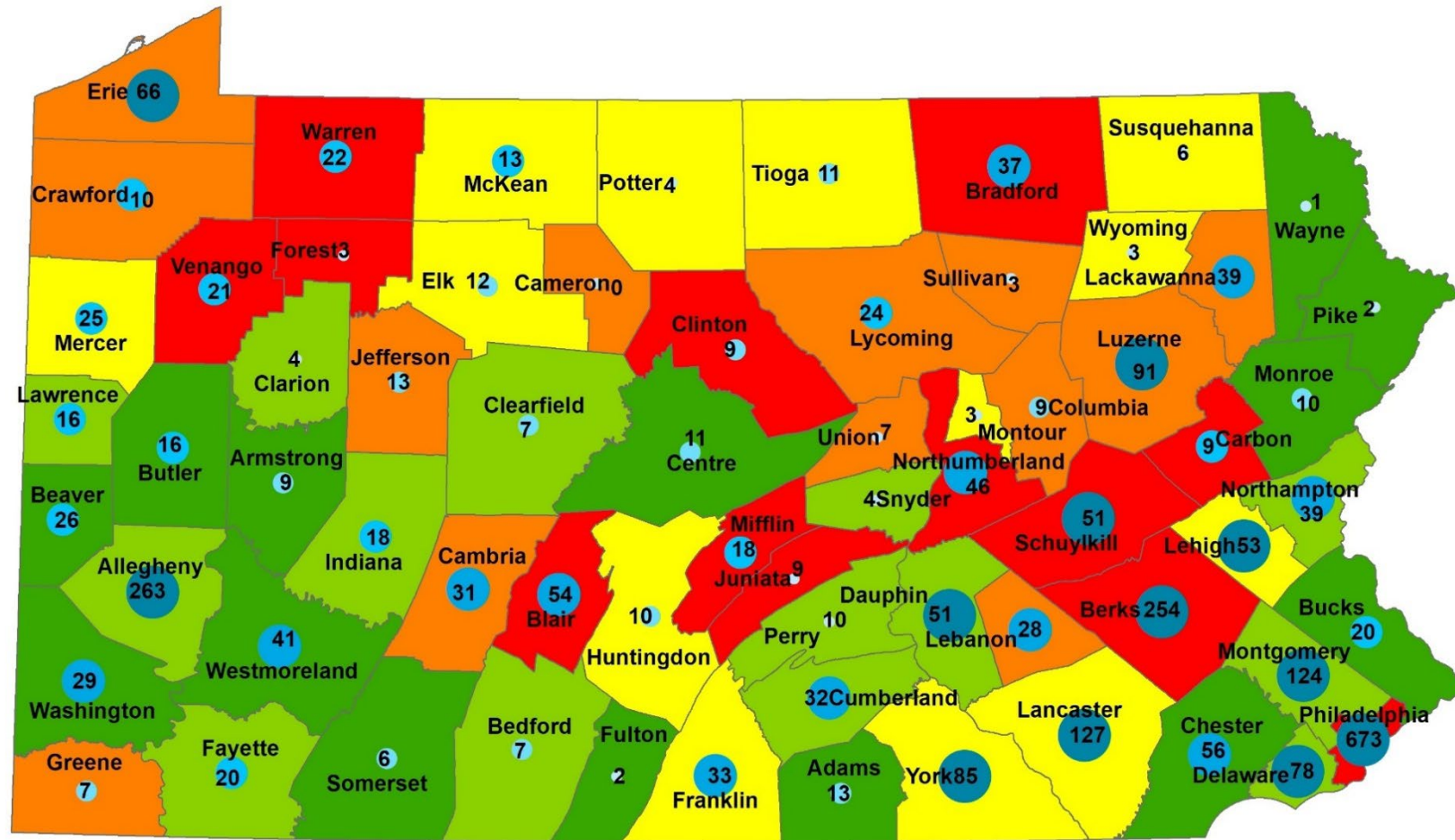
Figure 3: Number and Percentage* of Children Aged 0–71 Months Tested for Blood Lead Level by County, 2022



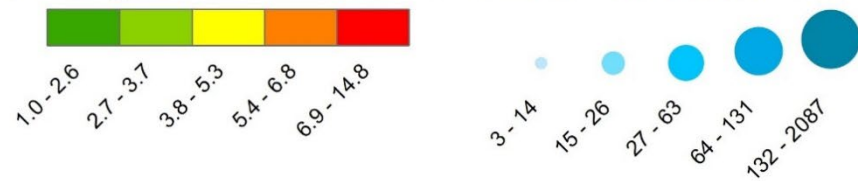
Data Sources: Pennsylvania's Electronic Reportable Disease Surveillance System and U.S. Census Bureau

*Percentage was calculated by dividing the number of children aged 0–71 months tested in each county by the 2019 intercensal estimate of the number of children aged 0–71 months residing in the county.

Figure 4: Number and Percentage* of Children Aged 0–71 Months with Confirmed Elevated Blood Lead Level by County, 2022.



Percentage of tested children with EBLL Number of children with EBLL



Data Sources: Pennsylvania's Electronic Reportable Disease Surveillance System and U.S. Census Bureau

*Percentage was calculated by dividing the number of children aged 0–71 months with EBLL by the total number of children aged 0–71 months tested for blood lead level in 2022.

Testing in Rural and Urban Counties:

The chart below contains testing data on children under age 6, broken out by residence in either a rural or urban county. The chart also further displays results broken out by EBLL and whether they were confirmed.

Table 17: Number of Children Aged 0–71 Months by Urban/Rural Status of County of Residence and Elevated Blood Lead Confirmation Status,* 2022

Status of county of residence	Population of children aged 0–71 months**	Children tested		Unconfirmed elevated (≥ 3.5 µg/dL)			Confirmed 3.5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population†	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Rural	199,773	33,524	16.78	494	1.47	0.25	713	2.13	0.36	321	0.96	0.16
Urban	633,529	122,494	19.33	1,466	1.20	0.23	2,640	2.16	0.42	1,176	0.96	0.19
Total	833,302	156,018	18.72	1,960	1.26	0.24	3,353	2.15	0.40	1,497	0.96	0.18

*Per CDC 2016 Elevated Blood Lead case definition

**2020 intercensal estimate

†Percent was calculated as the number of children tested/population of children in the county for the specified age range.

Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Note: A county is rural when the number of persons per square mile within the county is less than 284. Counties that have 284 persons or more per square mile are considered urban. The current mix of 48 rural and 19 urban counties has remained unchanged since 1970. Population projections from the Pennsylvania State Data Center show that this current mix of rural/urban counties will remain the same until 2040. Urban counties are Allegheny, Beaver, Berks, Bucks, Chester, Cumberland, Dauphin, Delaware, Erie, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Montgomery, Northampton, Philadelphia, Westmoreland, and York.

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This report can be found at: <https://www.health.pa.gov/Pages/default.aspx>.