



DELAWARE HEALTH AND SOCIAL SERVICES

Division of Public Health

Office of Healthy Environments

Childhood Blood Lead Surveillance in Delaware

2023 Annual Report

November 2023

Prepared by:
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Division of Public Health
Health Systems Protection Section
Office of Healthy Environments
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Childhood Blood Lead Surveillance in Delaware

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Delaware Department of Health and Social Services
Division of Public Health

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DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health
Office of Healthy Environments

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Executive Summary

This is the Delaware Department of Health and Social Services, Division of Public Health's (DPH) third childhood blood lead surveillance annual report that was prepared to satisfy the regulatory condition set forth in Delaware HB 222. This report presents lead testing data for children up to the age of 6 years in Delaware who were tested and reported during Fiscal Year (FY) 2023 and calendar years 2018 to 2022. The data were extracted from DPH's electronic reportable surveillance system. This document 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 Delaware.

Lead poisoning is a preventable occurrence but continues to be a significant environmental hazard for children in Delaware. Young children up to age 6, whose brains develop rapidly, are at greatest risk of harm from lead exposure. Childhood exposure to lead, through inhalation or ingestion, can cause long-term neurological damage and decreased intelligence that may be associated with learning and behavioral problems.

In FY2023, DPH received a total of 15,826 blood lead test results for children under 6 years old. The test results were comprised of initial tests, second tests, and subsequent follow-up tests. Of that total, there were 11,275 initial test results for individual children ages 0 to 72 months. There were 7,643 children (65% of the population) under the age of 28 months who were tested. There were 694 children between the ages of 0 and 72 months (5.9% of those tested) with an elevated blood lead level (EBLL) of greater than or equal to 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$). The largest number of second tests are from the age range that includes 2 years of age.

Approximately half of children did not have race or ethnicity information provided in their blood lead testing data. Among the submissions that included the information, 23.9% were identified as White and 13.8% were identified as Black. Those identified as White had the lowest EBLL percentage of 3.75% while all other identified races exhibited EBLL rates over 4.85%. Over 50% of the reported ethnicity data were indicated as unknown. The non-Hispanic category made up approximately 36.4% and the Hispanic category was 13.2%.

Testing summaries and EBLL data for the past five calendar years show the impact of the Coronavirus 2019 (COVID-19) pandemic on the distribution of testing by age. In 2022, testing increased in the 19 to 27 month age range.

Testing rate calculations found that 48% of 1-year-old children (9 to 15 months old) received their initial blood test in state fiscal year 2023. A total of 1,885 children received their second test at age 2 years (21 to 27 months), or 39% of children who received an initial test at 1 year old. For 2022, the overall testing rate for children under 6 years old (0 to 72 months) was calculated to be 54% based on the results received.

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Introduction

This third annual report was prepared to satisfy the condition set forth in Delaware [House Bill 222](#) related to Chapter 26, Title 16, §2606. Annual Report: “The Division of Public Health shall annually, on or before January 1, provide a report on elevated blood lead levels to the General Assembly...”

This report presents lead testing data for children up to the age of 6 years in Delaware who were tested and reported during Fiscal Year (FY) 2023 and calendar years 2018-2022. The data were extracted from DPH’s electronic reportable surveillance system. This document 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 Delaware.

Lead poisoning is a preventable occurrence but continues to be a significant environmental hazard for children in Delaware. Young children up to age 6, whose brains develop rapidly, are at greatest risk of harm from lead exposure. Childhood exposure to lead, through inhalation or ingestion, can cause long-term neurological damage and decreased intelligence that may be associated with learning and behavioral problems.

Delaware law differentiates blood lead analysis according to sample draw types, capillary and venous, and are respectively referred to as screening and testing. For this report there is no differentiation made and all blood lead analyses are referred to as testing. To meet the January 1 delivery date, the reporting period for the annual section of this report is set to the State of Delaware fiscal cycle of July 1, 2022, through June 30, 2023. This annual period allows for adequate time for internal preparation, review, and revision prior to delivery to the Delaware General Assembly. However, for ease of reference to the public reader, the report sections describing previous years’ testing results are presented by calendar year, 2019 to 2022.

During the five-year period covered in this report several significant changes to policy and regulatory requirements occurred.

1. The U.S. Centers for Disease Control and Prevention (CDC) changed its definition of their blood lead reference value (BLRV) used to identify an elevated blood level in children in 2021. From 2012 through most of 2021, the BLRV was 5.0 micrograms per deciliter ($\mu\text{g}/\text{dL}$). In October 2021 it was reduced to 3.5 $\mu\text{g}/\text{dL}$. However, for the entirety of this report, the reference value of 3.5 $\mu\text{g}/\text{dL}$ is used to signify an elevated level.
2. The Delaware Childhood Lead Poisoning Prevention Act was revised, along with the corresponding regulations 16 DE Administrative Code 4459A, to mandate child test testing at ages 1 and 2 years old.

Data Source

Since 1994, the State of Delaware has required by law that all children be tested for lead at 1 year and 2 years old if the child's environment indicates an increased risk for lead exposure as determined by the child's physician based on risk screening. All lead testing results for children must be reported to the Delaware Department of Health and Social Services, Division of Public Health (DPH) and presented to the public school at kindergarten enrollment. In 2021, this law was revised under House Bill 222. As it mandates universal testing at age 2, the risk screening was no longer required. The revised law requires that all lead testing results must be reported to DPH, and that proof of a blood lead test be presented for enrollment into a licensed childcare facility and public-school kindergarten.

DPH's Lead Poisoning Prevention Program performs childhood blood lead surveillance for Delaware. All laboratories, health systems, and medical practices are required by law to transmit all child blood lead test results to the program. DPH's Healthy Homes and Lead Poisoning Surveillance System (HHLPSS) database receives and stores the reported test results. All data in this report are from children ages birth to 72 months, i.e., under 6 years old at the time of sampling. No data for individuals older than 72 months of age at the time of testing is included in this report.

Unless noted, the data reflect initial tests only and not follow-up testing. An exception is the evaluation of children ages 21 to 27 months where a child's second test is reported to determine the impact of the universal testing requirement at or around 24 months. Further, any data on an individual's test submitted to HHLPSS determined to be incomplete or containing possible errors were excluded.

Overview: The Impact of Childhood Lead Poisoning

Lead poisoning is a preventable occurrence but continues to be a significant environmental hazard for children in Delaware. Young children up to age 6, whose brains develop rapidly, are at greatest risk of harm from lead exposure. Childhood exposure to lead, through inhalation or ingestion, can cause long-term neurological damage and decreased intelligence that may be associated with learning and behavioral problems. Even low levels of lead in the body correlate to a lower IQ, reduced attentiveness, and impaired academic achievement. Children with even slightly elevated blood lead levels have a higher risk of developing attention-deficit/hyperactivity disorder. Childhood lead poisoning effects extend across the lifespan, impacting health, higher learning, and the ability to remaining employed. (The Association between Lead and Attention-Deficit/Hyperactive Disorder: A Systematic Review, *Int. J. Environ. Res. Public Health* 2019, 16(3), 382; <https://doi.org/10.3390/ijerph16030382>).

There is no safe level of lead in the body. Continuing research has led to a better understanding of poor health outcomes in children due to this environmental toxin at even lower levels than previously understood. Based on this research, on October 28, 2021, the U.S. Centers for Disease Control and Prevention (CDC) lowered its blood lead reference value (BLRV), used to identify children with blood lead levels statistically higher (97.5th percentile) than the majority of children, from 5.0 micrograms per deciliter ($\mu\text{g}/\text{dL}$) to 3.5 $\mu\text{g}/\text{dL}$.

Reducing the risk of childhood lead poisoning is achieved by identifying and removing lead hazards from the environment before a child is exposed. Although children can be exposed to lead from many sources, lead-based paint, and the lead-containing dust it creates, is the most common source of lead exposure. As a result, the federal government banned the production and sale of lead-based paint for residential use in 1978. However, some builders with lead-based paint in their inventories continued to use the paint in homes through the 1980s. Many of these older homes still contain lead-based paint that deteriorate and create lead-containing dust as they age. Additional sources of lead exposure include drinking water from lead supply pipes and solder, lead-contaminated soil, toys, traditional health remedies, spices, and medicinal supplements.

In Delaware, approximately 42% of dwellings were built before 1979 (Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates). As is the case nationally, lead poisoning is a more prevalent problem facing low-income families living in older unmaintained dwellings. Many of these dwellings are rental properties. Even though work in Delaware over the last 25 years has resulted in a significant drop in the number of children with elevated blood lead levels, disparities persist. Those disproportionately affected include children living below the federal poverty level, children living in older housing, and non-Hispanic Blacks, Latinos, immigrants, and refugees. Over the past decade (2012-2021), more than 5,200 children were reported to DPH with blood-lead levels over the current CDC blood lead reference level of 3.5 $\mu\text{g}/\text{dL}$, indicating an elevated blood lead level (EBLL).

Annually from 2016 to 2021, Delaware's Lead Poisoning Prevention Program identified communities with a higher risk of childhood lead poisoning to better target resources and to reduce health inequities associated with lead exposure in those communities. DPH determined risk by examining rates of elevated blood lead levels from first tests, the age of housing, and income levels for each of the state's cities and towns. The Program compiled the reported data, which identified Delaware ZIP Codes with the highest numbers of children with elevated blood lead levels of 3.5 $\mu\text{g}/\text{dL}$ or higher. The top 10 ZIP Codes with highest risk of childhood lead poisoning are in Wilmington (19805, 19802, 19801), Dover (19901, 19904), Newark (19702), New Castle (19720), Bear (19701), Seaford (19973), and Georgetown (19947). The Lead Poisoning Prevention Program is cooperating with other DPH programs to include lead testing data into census tract level reports. The project was not completed by the time of this report.

Case Management Plan

The Lead Poisoning Prevention Program (LPPP) has a dedicated Health Coordinator, two Case Managers, and three Investigators who conduct ongoing monitoring of case management activities. They are responsible for reviewing surveillance data, identifying children with high lead levels, and making appropriate referrals. DPH staff provide care coordination with primary care physicians for children with elevated blood lead levels using Case Management Standards, which follow CDC guidelines. Both the Program's Health Coordinator and Case Managers communicate with families and medical offices to assure that children at risk for lead poisoning are tested and that children who are identified with elevated results receive any eligible intervention services for which they may qualify.

The HHLPSS database enables the Data Management Analysts, Case Managers, and Investigators to frequently review childhood blood lead level results to ensure that children with elevated levels receive confirmatory testing, investigations, and follow-up care as necessary. The Data Management Analyst generates reports weekly to identify test submissions that are at or above the CDC BLRV. The Data Management Analyst and the Health Coordinator work with the Program's administrative staff to provide information to families who have children with reported blood lead levels of 3.5 µg/dL and above and to identify children whose levels are elevated enough to warrant opening a case. Annually, 300 families or more receive information due to an elevated lead result. All families also receive information by mail regarding possible eligibility for developmental intervention services offered by DPH through the Child Development Watch program.

Case management of elevated children is accomplished through a partnership with DPH's Community Health Section, which provides support for the Health Coordinator and case managers. During 2022 and 2023, whenever a child with an elevated blood lead level of 7.0 µg/dL or more is identified, the Health Coordinator notifies the child's primary care provider of the new case and follows through with phone calls, e-mails, and direct mailings of educational materials to the family. A case will close once two successive blood tests are below 7.0 µg/dL. The child's primary care provider will continue monitoring levels until they are below the reference level. Over the past two years, the revolving case management load is approximately 140 EBLL children and families. Starting in 2024, the elevated blood lead level of 7.0 µg/dL that initiates case management will be reduced to 3.5 µg/dL. To help maintain the increased caseload, DPH will contract community health works to assist with intake and recordkeeping.

The children with blood level values equal to or greater than 5.0 µg/dL are eligible for developmental intervention services offered through DPH. The case managers make direct referrals to the DPH Birth to Three program and the Data Management Analysts provide monthly lists to the program for all EBLL children.

Additionally, the case managers communicate with the LPPP's Investigators, who coordinate investigations to identify the possible source(s) of the lead hazards. If the investigation

identifies lead paint in the home as the likely source of the lead exposure, it is considered to be a “lead exposure site.” The Investigator arranges a Lead Hazard Risk Assessment of the residence by an environmental testing firm. A Lead Hazard Risk Assessment is an on-site investigation to determine the existence, nature, severity, and location of lead-based paint hazards. Following the assessment, the Investigator contacts the property owner to review the findings and discuss options for what must be done to fix any lead-based paint hazards. The number of Lead Risk Assessments performed annually varies. For fiscal year 2023 (FY23), 29 potential lead exposure sites were identified, and Lead Hazard Risk Assessments were performed.

Blood Lead Testing Data Fiscal Year 2023

In FY23, there was a total of 15,826 blood lead results reported to the Lead Poisoning Prevention Program for Delaware children from birth to 72 months. The total number of tests include initial tests, second tests, and all follow-up tests. Of the total, 11,725 were for the initial tests, i.e., a child’s first test. Table 1 summarizes the initial blood lead level (BLL) testing results in total, distribution by age, and the number of tests above the CDC blood lead reference level of 3.5 µg/dL. The CDC blood lead reference value (BLRV) was 5.0 µg/dL until October 3, 2021, when it was reduced to 3.5 µg/dL. However, for consistency and report simplification, only the current BLRV of 3.5 µg/dL is used as an EBLL reference. The maximum value reported (not shown in Table 1) was 70 µg/dL.

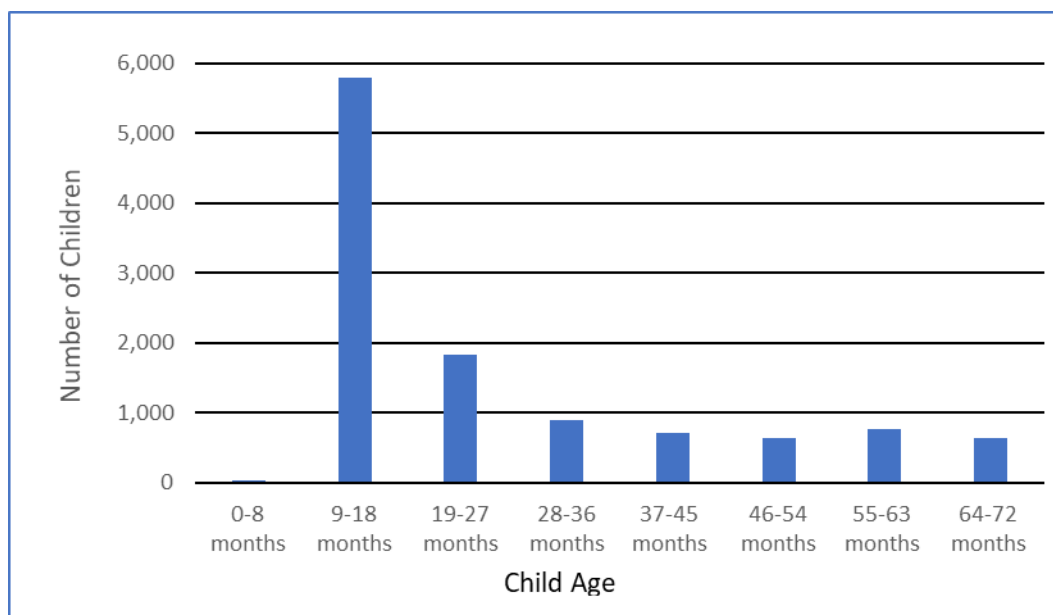
The age distribution provided in Table 1 is graphically represented in Figure 1. The high degree of initial testing at age 1 is clear.

Table 1. Number of Initial Lead Tests and Elevated Blood Lead Levels (EBLL) for children 0-72 months, Delaware, FY 2023

Age Distribution	# of BLL Tests	Percent of Total Initial Tests	Total EBLLs $\geq 3.5 \mu\text{g/dL}$	Percent of EBLL of Total Tests	Percent of EBLL per Age
0-8 months	32	0.3%	4	0.03%	12.5%
9-18 months	5,787	51.3%	361	3.1%	6.2%
19-27 months	1,824	16.2%	141	1.2%	7.7%
28-36 months	900	8.0%	76	0.6%	8.4%
37-45 months	710	6.3%	32	0.3%	4.5%
46-54 months	629	5.6%	29	0.2%	4.6%
55-63 months	759	6.7%	36	0.3%	4.7%
64-72 months	634	5.6%	15	0.1%	2.4%
Totals	11,275	100.0%	694	5.9%	
Summary of Elevated Blood Lead Level (EBLL)					
Total EBLLs $\geq 3.5 \mu\text{g/dL}$		694	Percent EBLLs of Initial Tests		5.9%

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), $\mu\text{g/dL}$ = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Figure 1. Age Distribution of Children Receiving an Initial Blood Lead Test, Delaware, FY 2023



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

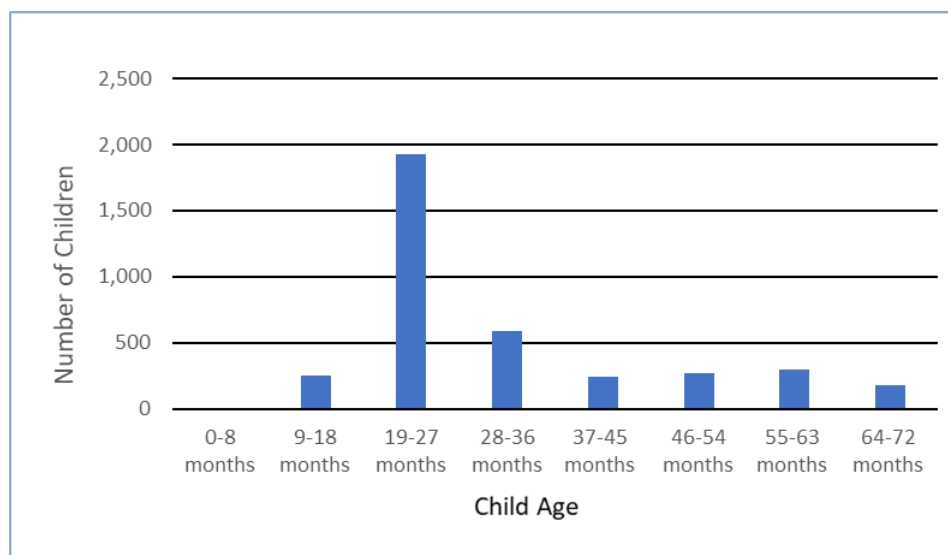
The age distribution of all tests (including follow-up tests for EBLL children), initial tests, and second tests are provided in Table 2. Figure 2 graphically depicts the age distribution of second tests. The most second tests occurred in the 19 to 24 months range.

Table 2. Number of Total, Initial, and Second Lead Testing for Children 0-72 months, Delaware, FY 2023

Age	Total Number of All Tests	Number of Initial BLL Tests	Number of 2nd BLL Tests
0-8 months	32	32	0
9-18 months	6,060	5,787	248
19-27 months	3,976	1,824	1,930
28-36 months	1,710	900	589
37-45 months	1,033	710	242
46-54 months	997	629	266
55-63 months	1,148	759	300
64-72 months	870	634	175
Total	15,826	11,275	3,750

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), $\mu\text{g}/\text{dL}$ = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Figure 2. Age Distribution of Children Receiving Second Blood Lead Test, Delaware, FY 2023



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Table 3 indicates that both initial and second lead tests are present within the month ranges that represent 1-year-olds and 2-year-olds. Test totals include initial, second, and follow-up tests for EBLL children.

Table 3. Initial and Second Lead Testing for children 9-15 months and 21-27 months, Delaware, FY 2023

Age	Total Tests	# of Initial BLL Tests	# of 2nd BLL Tests
9-15 months	5,174	4,996	165
21-27 months	3,509	1,410	1,885

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), $\mu\text{g}/\text{dL}$ = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Demographic data is reported, although it is not consistently provided to DPH, in Tables 4 to 6.

Table 4. Number of Lead Tested Children ages 0-72 months by Gender, Case Total, and Elevated Blood Lead Level (EBLL) Percentage, Delaware, FY 2023

Gender	Number Tested	EBLL Cases	% EBLL
Male	5,520	330	5.98%
Female	5,310	272	5.12%
Unknown	445	92	20.67%
Total	11,275	694	

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), $\mu\text{g}/\text{dL}$ = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Table 5. Number of Lead Tested Children ages 0-72 months by Ethnicity, Case Total, and Elevated Blood Lead Level (EBLL) Percentage, Delaware, FY 2023

Ethnicity	Number Tested	EBLL Cases	% EBLL	Ethnicity % of Total Tested
Hispanic	1,489	85	5.71%	12.25%
Non-Hispanic	4,099	272	6.64%	39.19%
Unknown	5,687	337	5.93%	48.56%
Total	11,275	694		

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), $\mu\text{g}/\text{dL}$ = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Table 6. Number of Lead Tested Children ages 0-72 months by Race, Case Total, and Elevated Blood Lead Level (EBLL) Percentage, Delaware, FY 2023

Race	Number Tested	EBLL Cases	% EBLL	Race % of Total Tested
American Indian	25	--	--	0.2%
Asian/Pacific	262	18	6.87%	2.3%
Black	1,560	76	4.87%	13.8%
White	2,693	101	3.75%	23.9%
Other	949	19	2.00%	8.4%
Unknown	5,784	478	8.26%	51.3%
Refused to Answer	--	--	0.00%	0.0%
Total	11,275	694		

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), $\mu\text{g}/\text{dL}$ = micrograms per deciliter. "--" denotes the data was suppressed due to being less than 10 as per DPH privacy guidelines. Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Data Summary and Evaluation of Fiscal Year 2023

The following list summarizes the FY23 childhood blood lead levels data.

- A total of 11,725 initial blood lead test were reported to DPH. A total of 5.9% (694 tests) were at or above the current CDC reference level of 3.5 $\mu\text{g}/\text{dL}$. Children 36 months of age and younger had a higher total number of tests over the reference level as compared to children over 36 months.
- The age range with the largest percentage of initial testing occurred at 9 to 18 months at 51.3% and is considered to be a result of the regulatory requirement for testing at 12 months of age. The age range of 9 to 15 months, which is the testing ranged defined as age 1 year in the regulations, contained 42.6% of the total initial tests.
- The second largest percentage of initial tests was 16.2% and occurred at the 19 to 27 months age interval. It is assumed that this value indicates a delay in testing due to COVID and that once doctor visits increased, referrals for lead testing increased.
- For the children’s second lead test, the age range of 19 to 27 months had 1,930 tests reported, which comprises 51.5% of all second tests for the fiscal year. The age range of 21 to 27 months, which is the testing ranged defined as age 2 year in the regulations, contained 50.3% of the total second tests.
- Of the total reported initial tests, 65.2% occurred in the ages up to 27 months.
- The reported gender data indicated more males than females were tested and had a slightly higher percentage of EBLL children. However, since 94 of the EBLL results are

being reported as unknown in gender, it cannot be certain that males have a higher percent of elevated results compared to females.

- Over 48% of the reported ethnicity data were indicated as unknown. Although the non-Hispanic category was larger than the Hispanic category, the differences cannot be determined due to most of the ethnic data being unknown.
- Race was not identified in 51.3% of the reported tests.
- Of the reported races, those identified as White made up the highest portion of reported results at 23.9%, followed by those identified as Black at 13.8%. Those identified as White had the lowest EBLL percentage at 3.75%. while all other identified races exhibited EBLL rates over 4.85%.

Childhood Lead Testing Five-Year Comparison

The testing data for the previous five calendar years from 2018 to 2022 is presented in this section (Table 7). The data includes total initial reported tests, age distribution of initial tests, and total EBLL. Race, ethnicity, and gender are not presented because those demographics were missing from the majority of test reports and are therefore not comparable.

Table 7. Annual Numbers of Reported Initial Lead Test Results and Elevated Blood Lead Levels from 2018 to 2022 for children 0-72 months, Delaware.

	2018	2019	2020	2021	2022
Number of children tested	9,814	10,401	6,395	7,732	11,836
Age Distribution of Children receiving an Initial Blood Lead (BLL) Test					
0-8 months	67	40	29	30	20
9-18 months	5,517	5,554	3,746	4,086	5,674
19-27 months	1,282	1,568	879	1,359	2,319
28-36 months	570	686	386	517	1,110
37-45 months	517	542	255	345	744
46-54 months	473	504	278	359	605
55-63 months	681	764	399	534	756
64-72 months	707	743	423	502	608
Total number of BLL tests	9,814	10,401	6,395	7,732	11,836
Elevated Blood Lead Level Summary					
Total EBLL tests ≤ 3.5 µg/dL	360	382	195	195	419

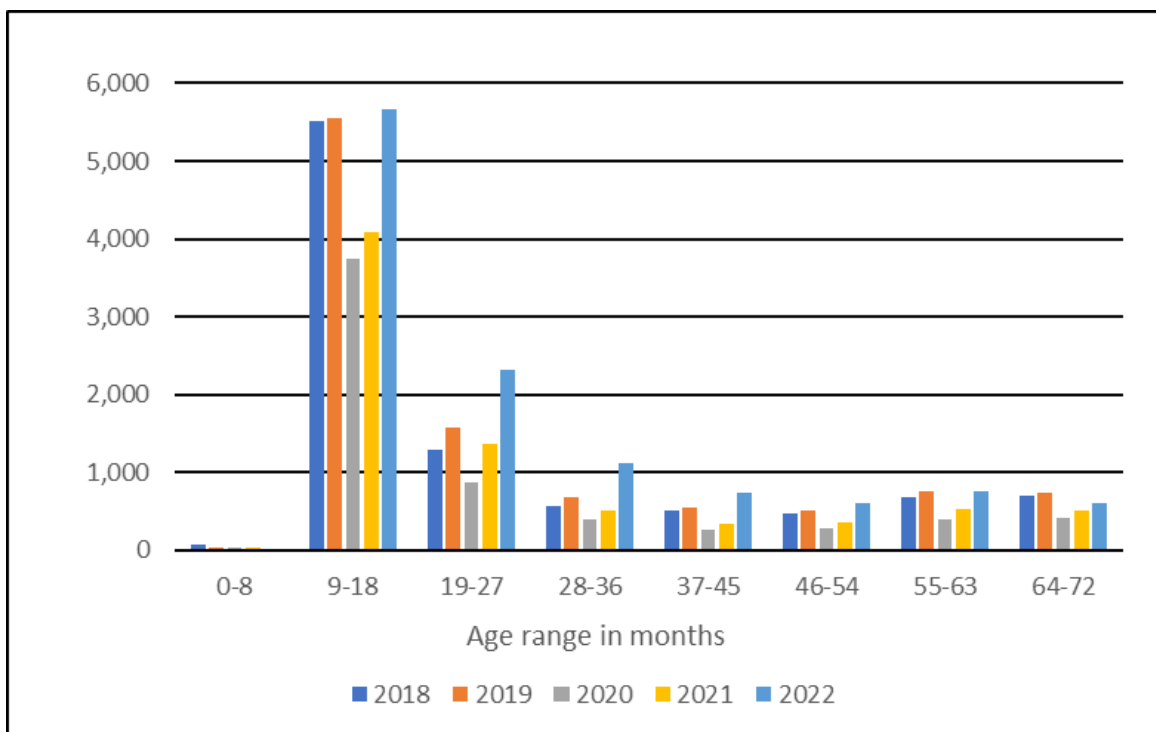
Footnote: BLL = Blood Lead Level, µg/dL = micrograms per deciliter

Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

As can be seen by the reduction in the number of children tested in 2020 and 2021, the COVID-19 pandemic negatively impacted childhood blood lead testing and reporting.

The age distributed testing numbers provided in Table 7 are graphically represented in Figure 3.

Figure 3. Number of Reported Initial Blood Lead Tests by Child’s Age in Months and Year of Testing, Delaware, 2018-2022



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

As seen in Table 7 and Figure 3, the age distribution for testing is similar for each year in that the intervals of 9 to 18 months and 19 to 27 months have the largest number of tests. During this five-year period, the universal testing in Delaware was only required for 1-year-old children in 2018 through mid-year of 2021. In 2021, Delaware required universal testing at ages 1 and 2 years old.

The age distribution for the number of EBLL tests reported for each of the years is shown in Table 8 with the graphical representation of the distribution in Figure 4. The intervals with the largest numbers of EBLL tests identified generally correlate to the intervals with the most initial tests performed.

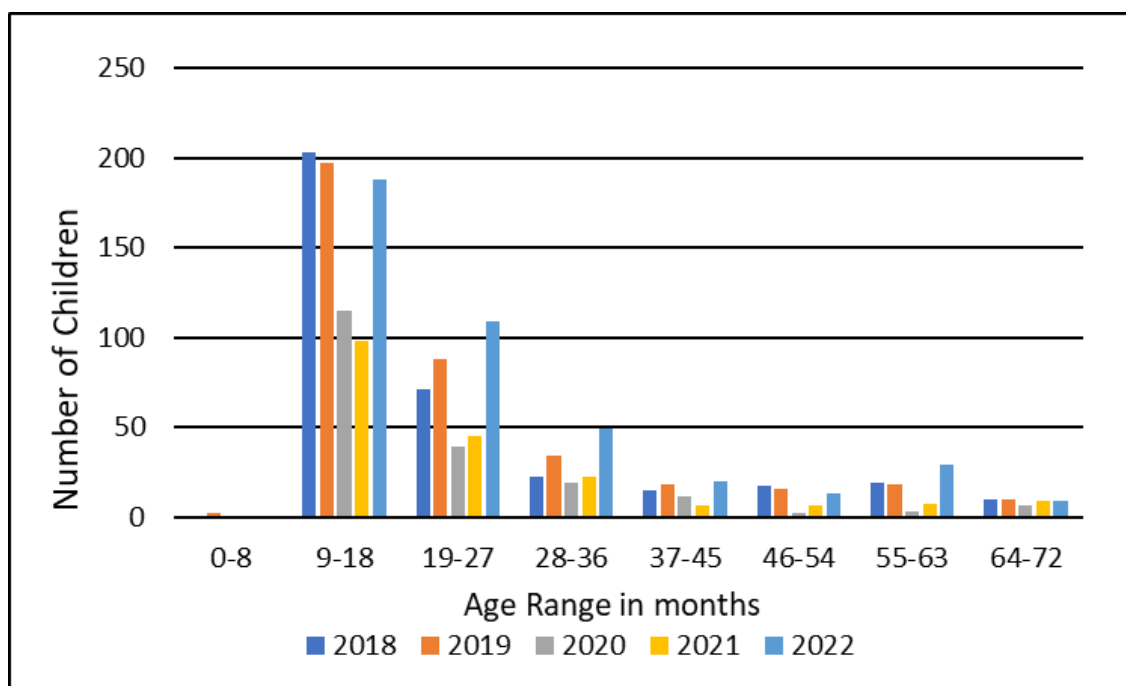
Table 8. Age Distribution of Children with Elevated Blood Lead Level (EBLL) at or above 3.5 ug/dL on Initial Blood Lead Test for Years 2018 - 2022, Delaware

Age	2018	2019	2020	2021	2022
0-8 months	-- ¹	--	--	--	--
9-18 months	203	197	115	98	188
19-27 months	71	88	39	45	109
28-36 months	22	34	19	22	49
37-45 months	15	18	11	6	20
46-54 months	17	16	2	6	13
55-63 months	19	18	3	7	29
64-72 months	10	10	6	9	9
Total ≤ 3.5 µg/dL	360	382	195	195	419
Percent EBLL of Initial BLL Tests	3.7%	3.7%	3.0%	2.5%	3.5%

Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), µg/dL = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

1 "--" value is considered too small and is suppressed as per DPH privacy rules.

Figure 4. Age Distribution of Children with Elevated Blood Lead Level (EBLL) at or above 3.5 ug/dL on Initial Blood Lead Test for Years 2018 - 2022, Delaware



Footnote: Blood Lead Level (BLL), Elevated Blood Lead Level (EBLL), µg/dL = micrograms per deciliter
 Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Data Summary and Evaluation for Five Year Comparison

The following list summarizes the five-year comparison of childhood blood lead levels data.

- Over the five-year period, the impact of the Coronavirus 2019 (COVID-19) pandemic is clearly represented. The total number of initial lead tests in children were lower in 2020 and 2021 than the years prior to the pandemic as well as in 2022 following the pandemic.
- The number of initial tests in 2022 is larger in almost every age interval than the previous four years, particularly in the range of 19 to 45 months. The exceptions are the 55 to 63 month interval, where in 2019 there were eight more tests reported; and the 64 to 72 month interval, where the years 2018 and 2019 reported 99 and 135 more tests, respectively.
- The marked increase in 2022 initial sampling for the 19 to 27 month age range may be indicative of delayed initial testing due to the pandemic. Supporting this presumption is that for the time frame when the same children were 1 year old (9 to 18 months of 2021), the testing was comparatively low.
- The EBLL tests ranged from 2.5% to 3.7% of their respective annual initial test totals.

Testing Rate Calculations

The childhood lead testing rates were calculated as a percentage for the recent fiscal year and the four previous calendar years for comparison. The four previous years were chosen to include the pre-pandemic year of 2019 so that the lower testing during 2020 and 2021 would not cause a misinterpretation of the comparison. The number of reported second tests at age 2 were also evaluated. The testing rates were calculated for the following.

- The testing percentage of 1-year-olds for 2019, 2020, 2021, 2022, and FY 2023 based on total number of live births the previous year..
- The testing percentage of second tests of two-year-olds for 2019, 2020, 2021, 2022, and FY 2023 as a percentage of the age 1 testing rate.
- The testing numbers of second tests of 2-year-olds for fiscal years 2021, 2022, and 2023 at one year and six-month intervals to ascertain direction of change
- The testing percentage for all children having at least one test from 0-72 months ending in calendar year 2022.

Table 9 includes the information and calculation for testing rates for years 2019 to 2022 and FY 2023. The population for FY 2023 is an estimate based on the average of previous years. The percent of second tests at age 2 was not calculated for 2018 since that would require the initial tests at age 1 from 2017.

Table 9. Number of Children Tested for Lead Poisoning at Age 1 and Age 2 Tests, Delaware, 2018 to 2022 and FY2023

Year	Population of Age 1 in Birth Year	Children Initially Tested at Age 1	Children with Second Test at Age 2	Percent 1st Test at Age 1	Percent 2nd Test at Age 2
2018	10,835	4,664	735	43%	not calculated
2019	10,539	4,587	1,213	44%	26%
2020	10,328	3,024	639	29%	14%
2021	10,688	2,815	1,004	26%	33%
2022	10,389	4,777	1,192	46%	42%
FY 2023	10,500*	4,996	1,885	48%	39%

Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Delaware Population Consortium, Population Projection Series, updated January 2023

“*” Population is average of previous years.

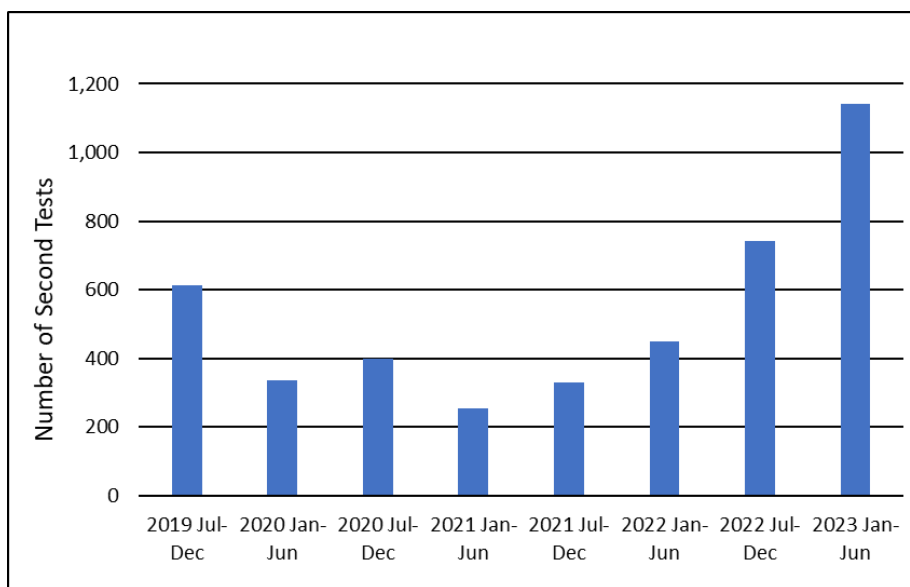
To visualize the incremental changes in the required second tests at age 2 up through June 2023, the previous four fiscal years were divided into six-month intervals. The purpose was to see if the regulatory change has had an impact on testing such that an increasing progression in testing was evident. Table 10 and Figure 5 display the results.

Table 10. Number of Children 21-27 months Reported as Receiving a Second Blood Lead Test, six-month Intervals, Delaware, July 2019 to June 2023

Six-month Interval	Number of 2 nd Tests	Fiscal Year Total
2019 Jul-Dec	612	948
2020 Jan-Jun	336	
2020 Jul-Dec	400	656
2021 Jan-Jun	256	
2021 Jul-Dec	331	780
2022 Jan-Jun	449	
2022 Jul-Dec	743	1,885
2023 Jan-Jun	1,142	

Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

Figure 5. Number of Children 0-72 months Receiving a Second Blood Lead Test, by six-month intervals, Delaware, July 2019 to June 2023



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023

To determine the overall testing rate in 2022 for children 0 to 72 months old, the total number of initial tests reported for children born from 2017 to 2022 was calculated and divided by the estimated population for the 0 to 72 month age range in 2022. Table 11 shows the values and the calculated rate, which is 54%.

Table 11. Number of Initial Tests for Children Age 0-72 months in 2022 and calculated Test Rate, Delaware, 2022

2022 Population 0-72 months	Number of Reported Initial Tests for all children born in 2017 - 2022	Test Rate 0-72 months in 2022 for Children with at Least an Initial Test
66,125	35,689	54%

Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2023
 Delaware Population Consortium, Population Projection Series, updated January 2023

The findings of the testing rates calculations are:

- The testing rate for initial tests at the 1-year-old age range of 9 to 15 months was 46% in 2022 and 48% so far in 2023.
- The testing percentage for 1-year-old children has greatly increased as compared to 2020 and 2021; however, it is only slightly greater than the 2018 and 2019 rates.
- The total number of second tests during the 21 to 27 month age range has been increasing due to the regulatory requirement for testing at age 2.
- The testing rate for children ages 0 to 72 months having at least one blood lead test is 54% based on the reports received.

Concluding Statements

Continued efforts, including educating health care providers of required testing and reporting; improving completeness of testing reports; and educating parents, can be expected to improve blood lead testing and test reporting. If such efforts continue to be successful, the testing data will reflect continued increases in testing rates and completeness of information. Over the next several years, upward trends are expected in the number of reported tests for the initial tests at age 1 year; and the second tests at age 2 years.