



*DELAWARE HEALTH AND SOCIAL SERVICES*

Division of Public Health

Office of Healthy Environments

---

## **Childhood Blood Lead Surveillance in Delaware**

---

### **2022 Annual Report**

Fiscal Year 2022 Data

December 2022

---

Prepared by:

Delaware Department of Health and Social Services

Division of Public Health

Health Systems Protection Section

Office of Healthy Environments

Lead Poisoning Prevention Program

# **Childhood Blood Lead Surveillance in Delaware**

## **2022 Annual Report**

**Fiscal Year 2022 Data**

**December 2022**

**Delaware Department of Health and Social Services  
Division of Public Health**

For more information, contact:  
Delaware Lead Poisoning Prevention Program

Division of Public Health

417 Federal Street

Dover, DE 19901

302-744-4546

Fax: 302-739-3839

<https://dhss.delaware.gov/dhss/dph/hsp/lead.html>



**DELAWARE HEALTH AND SOCIAL SERVICES**

**Division of Public Health**

**Office of Healthy Environments**

Suggested Citation: Delaware Department of Health and Social Services, Division of Public Health, Childhood Blood Lead Surveillance in Delaware, 2022.

## Table of Contents

Introduction .....	4
Data Source .....	4
Executive Summary .....	5
Overview: The Impact of Childhood Lead Poisoning .....	6
Case Management Plan.....	7
Blood Lead Testing Data Fiscal Year 2022.....	8
Table 1. Lead Testing Rates and Blood Lead Levels (µg/dL) for children 0-72 months, Delaware, FY 2022 .....	9
Figure 1. Age Distribution of Children Receiving an Initial Blood Lead Test, Delaware, FY 2022 .....	10
Table 2. Number of Lead Tested Children ages 0-72 months by Gender, Case Total, .....	10
and EBLL Percentage, Delaware, FY 2022.....	10
Table 3. Number of Lead Tested Children ages 0-72 months by Ethnicity,.....	10
Case Total, and EBLL Percentage, Delaware, FY 2022.....	10
Figure 2. Race Distribution for Children 0-72 months Tested for Lead, Delaware, FY 2022.....	11
Data Summary Fiscal for Fiscal Year 2022 .....	12
Elevated Blood Lead Levels Five-Year Trend.....	13
Table 5. Reported Lead Testing Rates and Blood Lead Levels (µg/dL) from 2017 to 2021 for children 0-72 months, Delaware.....	13
Figure 3. Number of Reported Initial Blood Lead Tests by Child’s Age in Months .....	14
and Year of Testing, Delaware, 2017-2021.....	14
Table 6. Age Distribution of Initial Blood Lead Test as Percent of the Annual Total Tests Reported for Years 2017 - 2021, Delaware. ....	14
Table 7. Age Distribution of Children with EBLL at or above 3.5 ug/dL .....	15
on Initial Blood Lead Test for Years 2017 - 2021, Delaware .....	15
Figure 4. Age Distribution of Children with EBLL at or above 3.5 ug/dL on Initial Blood Lead Test for Years 2017 - 2021, Delaware.....	15
Table 8. Age Distribution of EBLL on Initial Blood Lead Test in Percent of Total for Years 2017 – 2021, Delaware .....	16
Elevated Blood Lead Levels 10-Year Trend .....	16
Table 9. Reported Number of Tests and EBLL Totals in Children 0 – 72 months for Years 2012 – 2021, Delaware.....	17
Figure 5. Number of Children 0-72 months Reported as Receiving a Blood Test from 2012 through 2021, Delaware, FY 2022.....	17
Figure 6. Number of EBLL Tests Reported from 2012 through 2021, Delaware, FY 2022 .....	18
Concluding Statements .....	18

## Introduction

---

This second annual report was prepared to satisfy the condition set forth in Delaware [House Bill 222](#) from the 151<sup>st</sup> General Assembly 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...”

In order to meet the January 1 delivery date as outlined in the legislation, the reporting period for the annual section of this report is set to the State of Delaware fiscal cycle of July 1, 2021, through June 30, 2022. 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 of five- and ten-year trends for lead testing are presented by calendar year.

During the period covered in this report, 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. 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.

## Data Source

---

Since 1994, the State of Delaware has required by law that all children be tested for lead at one year of age and additionally at two years old if the child’s environment indicates an increased risk for lead exposure as determined by the child’s physician using a set of risk screening questions. All lead testing results for children were to be reported to the Delaware Division of Public Health (DPH) and presented to the public school at kindergarten enrollment. This law was revised under HB 222 in 2021. As it mandates universal testing at age two, the risk screening was no longer required. The revised law continues to require that all lead testing results 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 the childhood blood lead surveillance for Delaware. All laboratories, health systems, and medical practices are required by law to send 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 values in this report are from children ages birth to 72 months, i.e., six years old at the time of sampling. No data for individuals older than 72 months of age at the time of testing is included.

Unless noted, the data reflects initial tests only and not follow-up testing. An exception is the five-year trend for children ages 21-27 months where initial and follow-up data are captured to establish the impact of the universal requirement of testing at, or around, 24 months. Further,

any test individual's datasets submitted to HHLPS that were determined to be incomplete or containing possible errors were excluded.

## **Executive Summary**

---

This is the Delaware Division of Public Health's (DPH) second childhood blood lead surveillance annual report and 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 six years in Delaware who were tested and reported during Fiscal Year (FY) 2022 and calendar years 2012-2021. 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 and across the country. Young children up to age six, 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 FY2022, DPH received 8,627 blood lead test results for individual children ages 0-72 months. There were 6,115 children (70.89% of the population) under age 28 months tested. There were 208 children between the ages of 0 and 72 months (2.41% of those tested) with an elevated blood lead level (EBLL) of  $\geq 3.5$  micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ).

Nearly 56% of children did not have race or ethnicity information provided in their blood lead testing results data. Among those children 0-72 months of age, those identified as White made up the highest portion with 22.29% tested, followed by those identified as Black at 12.31%. Those identified as White had the lowest EBLL percentage at 1.56% while all other races exhibited EBLL rates over 2.00%. Over 63% of the reported ethnicity data were indicated as unknown. The Non-Hispanic category made up approximately 26.9% and the Hispanic category was 9.6%.

This report also includes testing summaries and EBLL data for the past five-year and 10-year calendar intervals. The conclusions from the five-year testing history are that no age range appears to more, or less, likely to have EBLLs present and the distribution of testing by age varied little over the period. The 10-year history also shows a correlation between total testing and EBLL detection, indicating that the rate of EBLL detection varies little year over year. The multi-year data also shows the impact that the COVID-19 pandemic has on testing and reporting.

## 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 and across the country. Young children up to age six, 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 extends 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 elevated blood lead level (EBLL) reference value, used to identify children with blood lead levels, from 5.0 to 3.5 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ).

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 for pipes and solder, lead-contaminated soil, toys, traditional health remedies, spices, and medicinal supplements.

In Delaware, more than half of the homes (57%) were built before 1978 (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, 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 reference level of 3.5  $\mu\text{g}/\text{dL}$ , indicating an elevated blood lead level (EBLL).

Annually since 2016, 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 µg/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).

## **Case Management Plan**

---

The Lead Poisoning Prevention Program (LPPP) has a dedicated Health Coordinator, Case Manager, and Investigator 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 Manager 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 they may qualify for.

The HHLPSS database enables the Data Management Analyst, Health Coordinator, and Investigator 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 mail information to families who have children with reported blood lead levels of 3.5µg/dL and above and to identify children whose levels are elevated enough to warrant opening a case. Annually, 300 families or more receive mailings due to the 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 LPPP Health Coordinator. 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.

During telephone consultations with the parents/guardians, the Health Coordinator reviews with the family how to reduce lead dust hazards in the home and to explain medical protocols. The Health Coordinator then mails appropriate materials such as additional educational materials and updates medical practices and families on case progress.

The Health Coordinator works with the LPPP's Principal Investigator, who investigates the possible source of the lead hazard. If the investigation identifies lead paint in the home as the likely source of the lead exposure, the Program arranges a Lead Hazard Risk Assessment of the residence by an environmental testing firm under contract. 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 Principal Investigator contacts the property owner to review the findings and discuss options for what must be done to fix any lead-based paint hazards. Over 40 Lead Risk Assessments occur annually; however, repairs to reduce the lead exposures is not required by law and is the decision of the property owner to reduce the hazards.

Based on the case management investigations, lead-based paint is the main cause of childhood elevated blood lead in Delaware. Secondly are consumed spices and herbs followed by other objects in the home. No elevated blood lead levels were found to be caused by drinking water.

### **Blood Lead Testing Data Fiscal Year 2022**

---

In FY22, 8,627 Delaware children from birth to 72 months of age were tested. Table 1 summarizes the 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 total number of elevated blood lead levels (EBLLs) in Table 1 is separated by values below and above 5.0 µg/dL. Until October 3, 2021, the CDC blood lead reference value (BLRV) was 5.0 µg/dL and was reduced to 3.5 µg/dL. Additionally, the number of tests equal to or greater than 5.0 µg/dL provides a measure of the number of children that are eligible for developmental intervention services offered through DPH. The maximum value reported (not shown in Table 1) was 38.6 µg/dL. Thirty-six (36) tests had values over 10 µg/dL, which was the previous level for DPH case management.



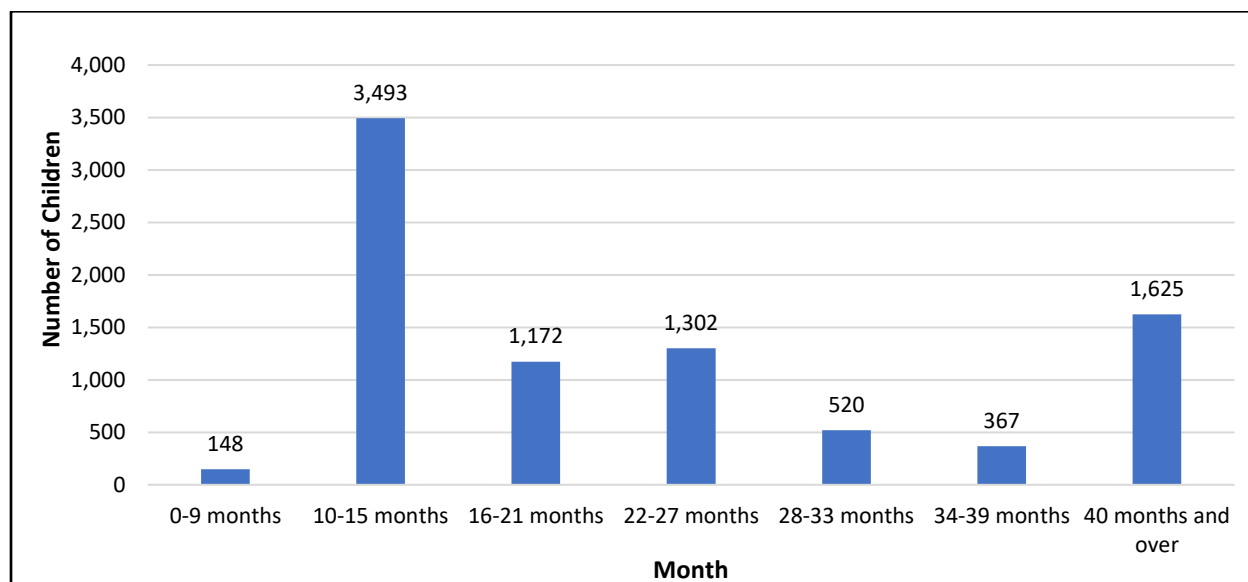
**Table 1. Lead Testing Rates and Blood Lead Levels ( $\mu\text{g}/\text{dL}$ ) for children 0-72 months, Delaware, FY 2022**

	July 1, 2021 - June 30, 2022	Percentage of Total
<b>Number of Tests for Children Tested (<math>\leq 72</math> months)</b>		
Total Number of Children Tested	8,627	
<b>Age Distribution of Children receiving an Initial Blood Lead Level (BLL) Test</b>		
0-9 months	148	1.72%
10-15 months	3,493	40.49%
16-21 months	1,172	13.59%
22-27 months	1,302	15.09%
28-33 months	520	6.03%
34-39 months	367	4.25%
40 months and over	1,625	18.84%
<b>Total BLL tests</b>	<b>8,627</b>	<b>100.00%</b>
<b>Elevated Blood Lead Level (EBLL), in <math>\mu\text{g}/\text{dL}</math></b>		
Total EBLL 3.5-4.9 $\mu\text{g}/\text{dL}$	98	1.14%
Total EBLL $\geq 5$ $\mu\text{g}/\text{dL}$	110	1.28%
<b>Total EBLL tests</b>	<b>208</b>	<b>2.41%</b>

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 2022

The age distribution provided in Table 1 is graphically represented in Figure 1.

**Figure 1. Age Distribution of Children Receiving an Initial Blood Lead Test, Delaware, FY 2022**



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

Demographic data is reported, although it is not consistently provided (Tables 2-4).

**Table 2. Number of Lead Tested Children ages 0-72 months by Gender, Case Total, and EBLL Percentage, Delaware, FY 2022**

Gender	Number Tested	EBLL Cases	% EBLL
Male	4,067	102	2.51%
Female	3,871	74	1.91%
Unknown	689	32	4.64%
<b>Total</b>	<b>8,627</b>	<b>208</b>	<b>2.41%</b>

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 2022

**Table 3. Number of Lead Tested Children ages 0-72 months by Ethnicity, Case Total, and EBLL Percentage, Delaware, FY 2022**

Ethnicity	Number Tested	EBLL Cases	% EBLL	Ethnicity % of Total Tested
Hispanic	827	20	2.42%	9.59%
Non-Hispanic	2,320	142	6.12%	26.89%
Unknown	5,480	46	0.84%	63.52%
<b>Total</b>	<b>8,627</b>	<b>208</b>	<b>2.41%</b>	

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 2022

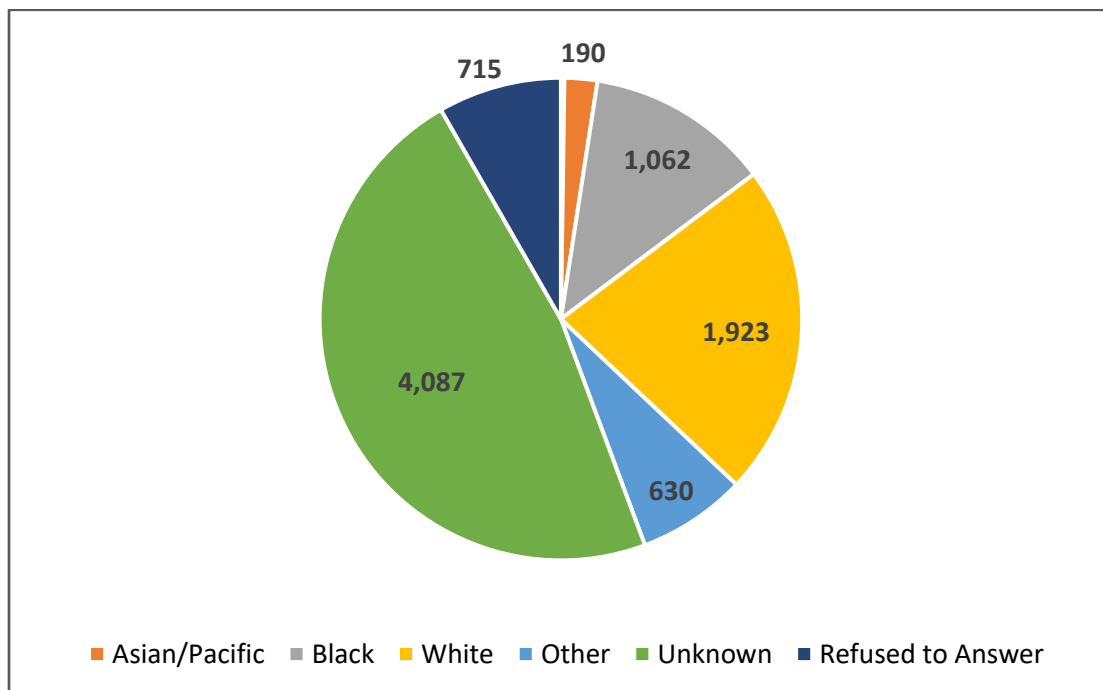
**Table 4. Number of Lead Tested Children ages 0-72 months by Race, Case Total, and EBLL Percentage, Delaware, FY 2022**

Race	Number Tested	EBLL Cases	% EBLL	Race % of Total Tested
American Indian	-- <sup>1</sup>	--	--	--
Asian/Pacific	190	--	--	--
Black	1,062	28	2.64%	12.31%
White	1,923	30	1.56%	22.29%
Other	630	13	2.06%	7.30%
Unknown	4,087	132	3.23%	47.37%
Refused to Answer	715	0	0.00%	8.29%
<b>Total</b>	<b>8,627</b>	<b>208</b>	<b>2.41%</b>	

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 2022

1 "--" denotes the data was suppressed due to being less than 10 as per DPH privacy guidelines.

**Figure 2. Race Distribution for Children 0-72 months Tested for Lead, Delaware, FY 2022**



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

## **Data Summary Fiscal for Fiscal Year 2022**

---

The following list summarizes the FY22 childhood blood lead levels data.

- Of the 8,627 initial blood lead tests reported to DPH, a total of 208 children tested at or above the current CDC reference level of 3.5 µg/dL. This equates to 2.41% of the total reported test results.
- The age range with the largest percentage of testing occurred at 10-15 months at 40.49% and is considered to be a result of the regulatory requirement for testing at 12 months of age.
- The second largest percentage occurred at the 40 months-and-over age range at 18.84% and possibly corresponds with testing that occurred in order to enroll in public kindergarten.
- Of the total reported values, 70.89% of the tests occurred in the ages up to 27 months.
- The reported gender data indicated more males than females were tested but with the size of the unknown being reported, this cannot be certain. However, the rate of EBLL in the males was higher than in the females, even if all unknown gender entries were considered to be female.
- Over 63% of the reported ethnicity data were indicated as unknown as it is self-identifiable. Although the Non-Hispanic category was larger than the Hispanic category, relative differences cannot be determined due to the majority of the ethnic data being unknown.
- Race was not identified in 55.7% of the reported tests, which is the combination of 'unknown' (47.4%) and 'refused to answer' (8.3%) of all cases. The highest percentage of EBLL children with unknown race was 3.23%.
- Only a small number of individuals were reported to be American Indian; therefore, the rate cannot be considered accurate to represent the population.
- Of the reported races, those identified as White made up the highest portion of those tested at 22.29%, followed by those identified as Black at 12.31%. Those identified as White had the lowest EBLL percentage at 1.56% while all other races exhibited EBLL rates over 2.00%.

## Elevated Blood Lead Levels Five-Year Trend

The testing data for the previous five calendar years from 2017 to 2021 is presented in this section (Table 5). The FY 22 data includes total reported tests, age distribution of initial tests, and total EBLL tests for values from 3.5 µg/dL to 4.9 µg/dL, and equal to or greater than 5.0 µg/dL. Race, ethnicity, and gender are not presented because those demographics were missing from the majority of test forms.

**Table 5. Reported Lead Testing Rates and Blood Lead Levels (µg/dL) from 2017 to 2021 for children 0-72 months, Delaware**

	2017	2018	2019	2020	2021
Number of children tested	10,156	8,973	10,324	6,274	7,169
<b>Age Distribution of Children receiving an Initial Blood Lead (BLL) Test</b>					
0-9 months	146	153	182	142	114
10-15 months	4,583	4,002	4,495	2,908	3,103
16-21 months	1,207	1,075	1,252	903	876
22-27 months	821	828	1,129	579	928
28-33 months	443	365	469	255	336
34-39 months	445	401	450	250	291
40 and above	2,511	2,149	2,347	1,237	1,521
<b>Total number of BLL tests</b>	<b>10,156</b>	<b>8,973</b>	<b>10,324</b>	<b>6,274</b>	<b>7,169</b>
<b>Elevated Blood Lead Level (ug/dL)</b>					
Total EBLL 3.5-4.9 ug/dL	198	186	193	88	74
Total EBLL ≥ 5 ug/dL	118	88	164	94	103
<b>Total EBLL tests</b>	<b>316</b>	<b>274</b>	<b>357</b>	<b>182</b>	<b>177</b>

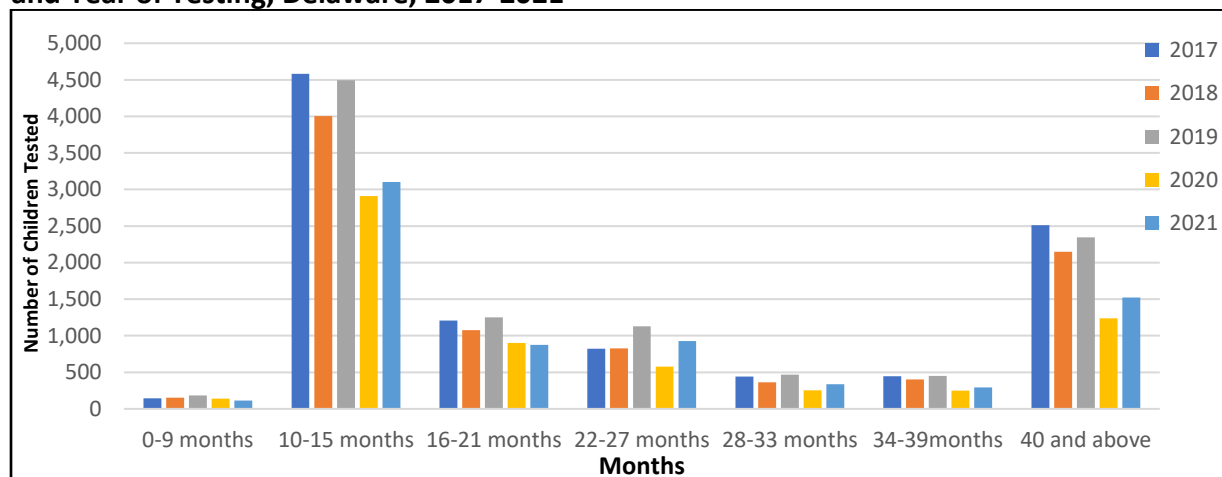
Footnote: BLL = Blood Lead Level, µg/dL = micrograms per deciliter

Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

The COVID-19 pandemic is shown to have negatively impacted childhood blood lead testing and reporting. This can be seen by the reduction in the number of children tested in 2020 and 2021. Although testing increased in 2021 and FY 2022 (presented earlier in this report), the overall testing and reporting was still below the pre-COVID year of 2019.

The age distribution provided in Table 5 is 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, 2017-2021**



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

As seen in Table 5 and Figure 3, the age distribution for testing is similar across the five-year period. The percentages for each age range per year was determined as well as the average for each range (Table 6). During this five-year period the universal testing in Delaware was for those aged one year old only.

**Table 6. Age Distribution of Initial Blood Lead Test as Percent of the Annual Total Tests Reported for Years 2017 - 2021, Delaware**

Age	2017	2018	2019	2020	2021	Average
0-9 months	1.44%	1.71%	1.76%	2.26%	1.59%	1.75%
10-15 months	45.13%	44.60%	43.54%	46.35%	43.28%	44.58%
16-21 months	11.88%	11.98%	12.13%	14.39%	12.22%	12.52%
22-27 months	8.08%	9.23%	10.94%	9.23%	12.94%	10.08%
28-33 months	4.36%	4.07%	4.54%	4.06%	4.69%	4.34%
34-39 months	4.38%	4.47%	4.36%	3.98%	4.06%	4.25%
40 and above	24.72%	23.95%	22.73%	19.72%	21.22%	22.47%
Total Number Tests	10156	8973	10324	6274	7169	

Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

Of the total reported values for the five-year period, children ages 10-15 months had the highest overall testing percentages, ranging from 43.28% in 2021 to 46.35% in 2020. This does not mean that age group reported the highest levels of lead. The second largest percentage tested was consistently at 40 months and over.

The age distribution for the number of EBLL tests reported for each of the years is shown in Table 7 with the graphical representation of the distribution in Figure 4.

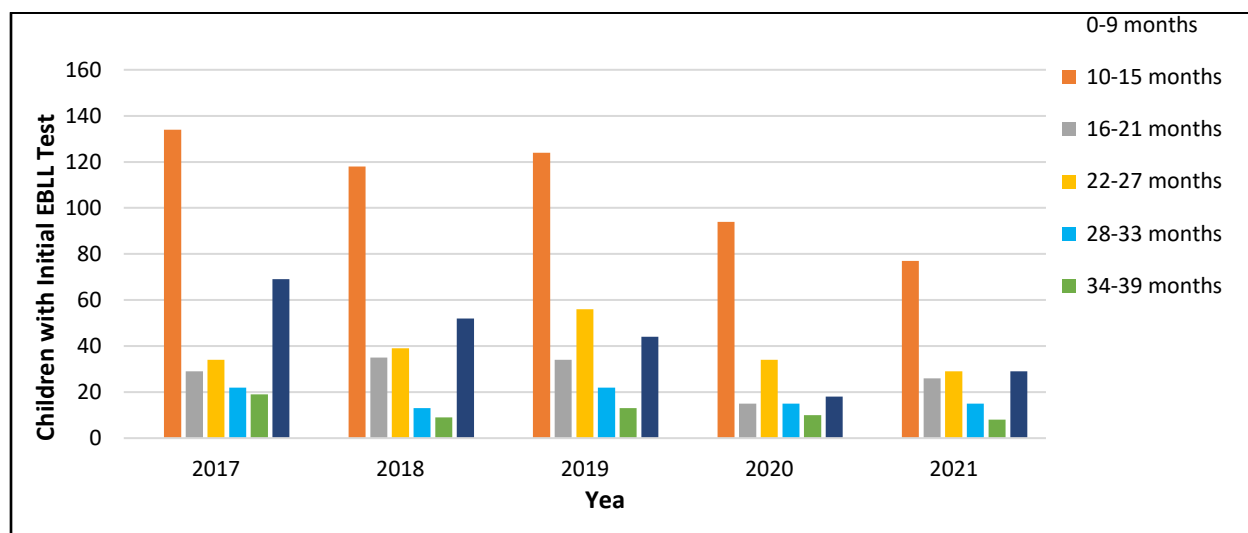
**Table 7. Age Distribution of Children with EBLL at or above 3.5 ug/dL on Initial Blood Lead Test for Years 2017 - 2021, Delaware**

Age	2017	2018	2019	2020	2021
0-9 months	-- <sup>1</sup>	--	--	--	--
10-15 months	134	118	124	94	77
16-21 months	29	35	34	15	26
22-27 months	34	39	56	34	29
28-33 months	22	13	22	15	15
34-39 months	19	9	13	10	—
40 and above	69	52	44	18	29

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 2022

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

**Figure 4. Age Distribution of Children with EBLL at or above 3.5 ug/dL on Initial Blood Lead Test for Years 2017 - 2021, 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 2022

The percentages of the total EBLLs per year were calculated and averages compared to the average percentages of the total annual tests (Table 8).

**Table 8. Age Distribution of EBLL on Initial Blood Lead Test in Percent of Total for Years 2017 – 2021, Delaware**

Age	2017	2018	2019	2020	2021	Average
0-9 months	1.92%	2.21%	1.68%	3.63%	0.54%	1.99%
10-15 months	42.81%	43.38%	41.61%	48.70%	41.62%	43.63%
16-21 months	9.27%	12.87%	11.41%	7.77%	14.05%	11.07%
22-27 months	10.86%	14.34%	18.79%	17.62%	15.68%	15.46%
28-33 months	7.03%	4.78%	7.38%	7.77%	8.11%	7.01%
34-39 months	6.07%	3.31%	4.36%	5.18%	4.32%	4.65%
40 and above	22.04%	19.12%	14.77%	9.33%	15.68%	16.19%
Total Number EBLL	313	272	298	193	185	

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 2022

As seen in Table 8, the average distribution, in percentages, is numerically similar to the percentage distribution of the total tests shown in Table 6. The inference from this analysis is that none of the age ranges appear to be more likely to have a greater number of EBLL tests.

### **Elevated Blood Lead Levels 10-Year Trend**

---

To evaluate the past 10-year period in testing from 2012 through 2021, the total number of reported tests, including follow-up tests, and test results were retrieved from the HHLPS database. Since the CDC reference level was 5 µg/dL until October 2021, both levels are presented. The total testing rates show significant variability over the period with the lowest testing year (2020) being half (51%) of the highest year (2016). The low testing totals in 2020 and 2021 are considered to be due to the impact of the COVID-19 pandemic. The data for the 10-year interval are shown in Table 9. The number and percentages of the EBLL tests reported are included. The total tests are shown graphically in Figure 5 and the EBLL totals in Figure 6.



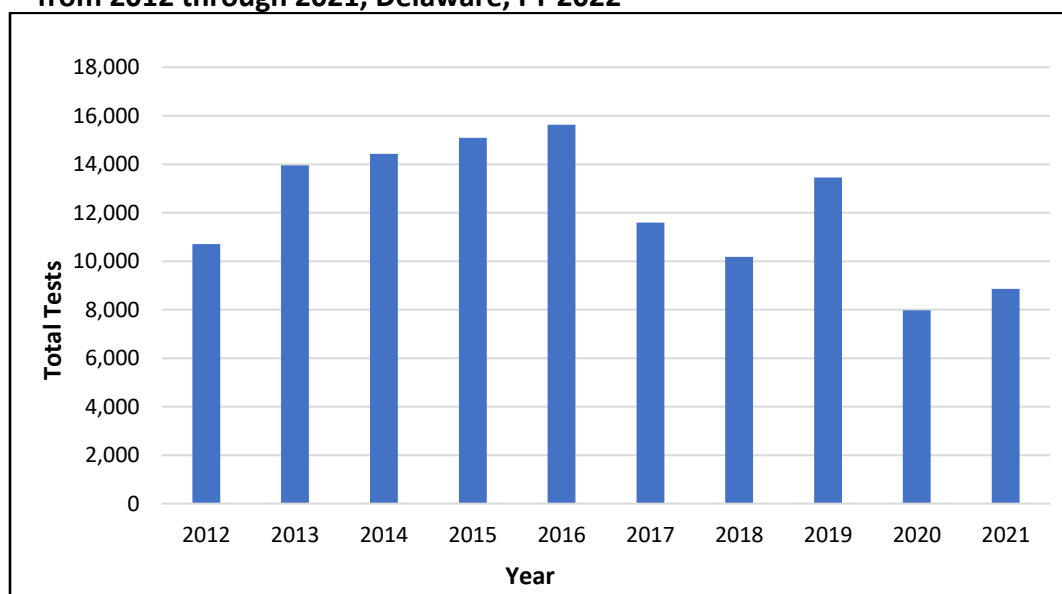
**Table 9. Reported Number of Tests and EBLL Totals in Children 0 – 72 months for Years 2012 – 2021, Delaware**

Year	Reported Number of Tests for Children	Total EBLL $\geq 3.5 - 4.9$ $\mu\text{g/dL}$	Total EBLL $\geq 5$ $\mu\text{g/dL}$	Total Reported EBLL	% EBLL $\geq 3.5-4.9$ $\mu\text{g/dL}$	% EBLL $\geq 5$ $\mu\text{g/dL}$	Total % EBLL of Reported Tests
2012	10,705	187	236	423	1.75%	2.20%	3.95%
2013	13,953	325	382	707	2.33%	2.74%	5.07%
2014	14,436	295	327	622	2.04%	2.27%	4.31%
2015	15,089	396	327	723	2.62%	2.17%	4.79%
2016	15,631	508	304	812	3.25%	1.94%	5.19%
2017	11,596	257	164	421	2.22%	1.41%	3.63%
2018	10,186	225	135	360	2.21%	1.33%	3.53%
2019	13,459	304	271	575	2.26%	2.01%	4.27%
2020	7,980	125	171	296	1.57%	2.14%	3.71%
2021	8,865	105	168	273	1.18%	1.90%	3.08%

Footnote: BLL = Blood Lead Level,  $\mu\text{g/dL}$  = micrograms per deciliter

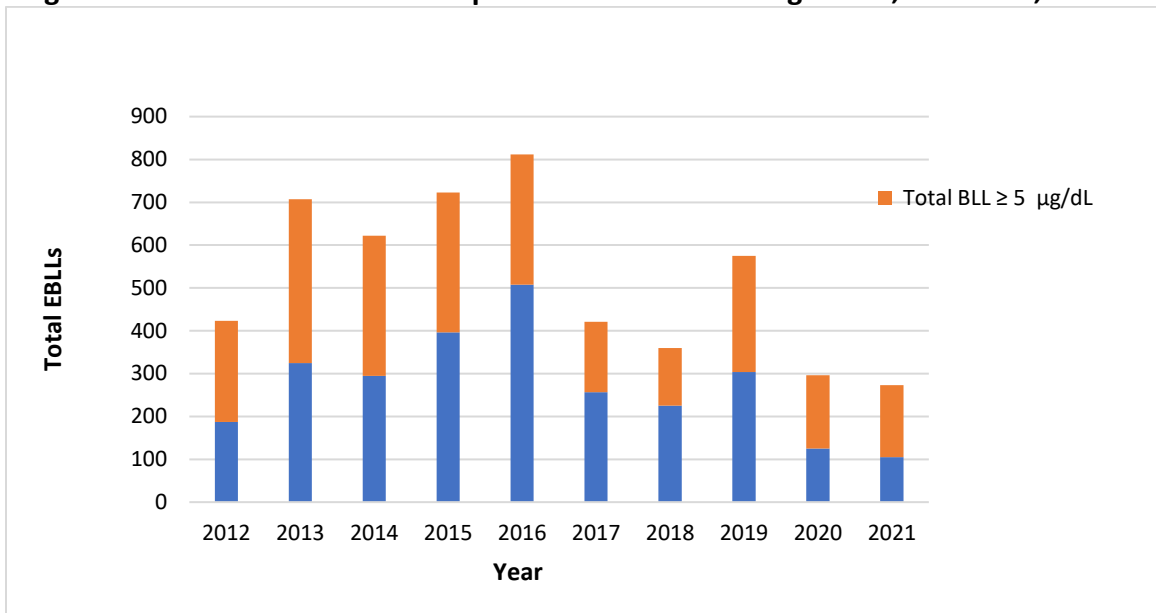
Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

**Figure 5. Number of Children 0-72 months Reported as Receiving a Blood Test from 2012 through 2021, Delaware, FY 2022**



Source: Delaware Department of Health and Social Services, Division of Public Health, Lead Poisoning Prevention Program, October 2022

**Figure 6. Number of EBLL Tests Reported from 2012 through 2021, Delaware, FY 2022**



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 2022

The general conclusions for the 10-year data summation are:

- COVID-19’s impact to testing is evident in the table and the figures. Years 2020 and 2021 have the lowest overall testing results reported to DPH.
- The year 2016 has highest total reported tests and the highest overall EBLL reported tests followed by 2015.
- As with the five-year data, the 10-year EBLL totals fluctuate similar to the total reported tests indicating that EBLL rates are not trending differently than the testing rate.

## Concluding Statements

---

Further efforts are needed to improve blood lead testing and test reporting. If such efforts are successful, the testing data will reflect increases in testing rate, reporting, and completeness of information. Over time, the increases will be seen statistically by upward trends, overall increased totals, increases in 21-27 month testing rates, and a decrease in the testing rates at 40 months and over.