Maryland
Department of the Environment

CHILDHOOD BLOOD LEAD SURVEILLANCE IN MARYLAND

2019 ANNUAL REPORT

October 2020

Calendar Year 2019 Data

Prepared by:
Land and Materials Administration
Lead Poisoning Prevention Program

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MARYLAND CHILDHOOD LEAD REGISTRY
ANNUAL SURVEILLANCE REPORT CY19

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Executive Summary

The Maryland Department of the Environment (MDE), Childhood Lead Registry (CLR) performs childhood blood lead surveillance for Maryland. The CLR receives the reports of all blood lead tests conducted on Maryland children 0-18 years of age and provides results to the Maryland Department of Health, including Medicaid, Immunet local health departments as needed for case management, and upon request to third parties for research and planning. Since 1995, the CLR has released a comprehensive annual report on statewide childhood blood lead testing and levels. This current report presents the childhood blood lead test results for calendar year (CY) 2019. All numbers are based on blood lead testing (venous or capillary) on children. The CLR does not receive and does not process any reports on lead screening based on the lead risk assessment questionnaire. With few exceptions all numbers refer to children 0-72 months of age.

CY19 Surveillance Highlights

* In CY19, the total number of children 0-18 years of age who were blood lead tested was 143,493. The total number of blood lead test results of children 0-18 years reported to the CLR was 150,222. A person may have multiple tests in the same year.

* In CY19, the total number of children 0-72 months of age who were blood lead tested was 132,224. This is an increase of 598 children (0.45%) compared to CY18. The total number of blood lead test results of children 0-72 months of age reported to the CLR was 138,657. This is an increase of 308 results (0.22%) compared to CY18.

* The number of children 0-72 months of age identified with a blood lead level ≥10 µg/dL decreased from 390 in CY18 to 328 in CY19, a 15.9% decrease.

* The number of children 0-72 months of age identified with a blood lead level of 5-9 µg/dL decreased from 1,435 in CY18 to 1,198 in CY19, a 16.5% decrease.

Overview

While the prevalence of blood lead levels of ≥10 µg/dL in children in Maryland has declined dramatically over the years (18.0% in 1995, 1.3% in 2005, and 0.2% in CY19), there are still children with historically elevated blood lead levels and a number of children exposed to lead every year. Lead poisoning occurs when lead enters the bloodstream and builds up to toxic levels. Many different factors such as the source of exposure, length of exposure, and underlying susceptibility (e.g., child's age, nutritional status, and genetics) affect how the body handles foreign substances. No safe blood lead level in children has been identified. Children are at the greatest risk from birth to age six while their neurological systems are developing. Exposure to lead can cause long-term neurological damage that may be associated with learning and behavioral problems and with decreased intelligence.

Sources of Childhood Lead Exposure

Lead-based paint hazards continue to be the major source of exposure for children in Maryland. Of an estimated 2,437,740 residential properties in Maryland, more than half (54.5%) were built in or before 1979 (Source: US Census Bureau, 2013-2018 American Community Survey, 5-Year Estimates). Properties built prior to 1978 may have lead-based paint. Although a significant number of residential rental units have been made lead free, there remain untreated units that may cause lead exposure in young residents.

When absorbed into the body, it can result in damage to the brain and nervous system, learning and behavior problems, slow growth and development, and hearing and speech problems. Lead poisoning is entirely preventable. The key is preventing children from being exposed to hazardous lead containing substances. Lead can be found inside and outside the home. The most common source of exposure is from dust caused by defective lead-based paint, which was used in many homes built before 1978. Children can be exposed by ingesting or inhaling lead dust created by deteriorated lead paint that has cracked and chipped, eating paint chips, or chewing on surfaces coated with lead-based paint, such as windowsills.

There are simple steps that can be taken to protect children from lead-based paint hazards in the home, such as regularly cleaning the home, washing hands and toys often, and wiping shoes before entering the home. Lead can also be found in drinking water. The most common sources of lead in drinking water are pipes, faucets, and fixtures. Other examples of possible sources of lead include some metal toys or toys painted with lead-based paint, furniture painted with lead-based paint, some metal-containing jewelry, some imported items (i.e., health remedies, foods and candies, cosmetics, powders or cosmetics used in religious ceremonies), and lead-glazed pottery or porcelain.

Statistical Report

In CY19, 132,224 children 0-72 months of age were tested for lead exposure statewide. Table One provides a summary of statewide statistics of blood lead testing in CY19.

Table One

CY 2019 Statistical Report

Item	Number	Percent (%)[1]
All Children		
Number of tests	150,222	
Number of children	143,493	
Children 0-72 Months		
Number of tests	138,657	
Number of children	132,224	100.0
Age		
Under One	10,862	8.2
One Year	48,099	36.4
Two Years	43,958	33.3
Three Years	10,867	8.2
Four Years	10,889	8.2
Five Years	7,549	5.7
Sex		
Female	63,404	48.0
Male	66,674	50.4
Undetermined	2,146	1.6
Highest Blood Lead Level (µg/dL)		
δ4	130,698	98.8
5-9	1,198	0.9
10-14	199	0.2
15-19	70	0.05
≥20	59	0.04
Mean BLL (Geometric mean)	1.65	
Blood Specimen		
Capillary	56,345	42.6
Venous	75,686	57.2
Undetermined	193	0.2

1. Due to rounding percentage to the first decimal point in this and other tables the sum of break down percentages may not equal total percentage.

The number of children 0-72 months of age tested for lead in CY19 (132,224) increased by 598 children compared to CY18 (131,626).

Figure One

Number of Children 0-72 Months Tested for Lead and Number Reported to Have Blood Lead Level 10 g/dL: CY00-19

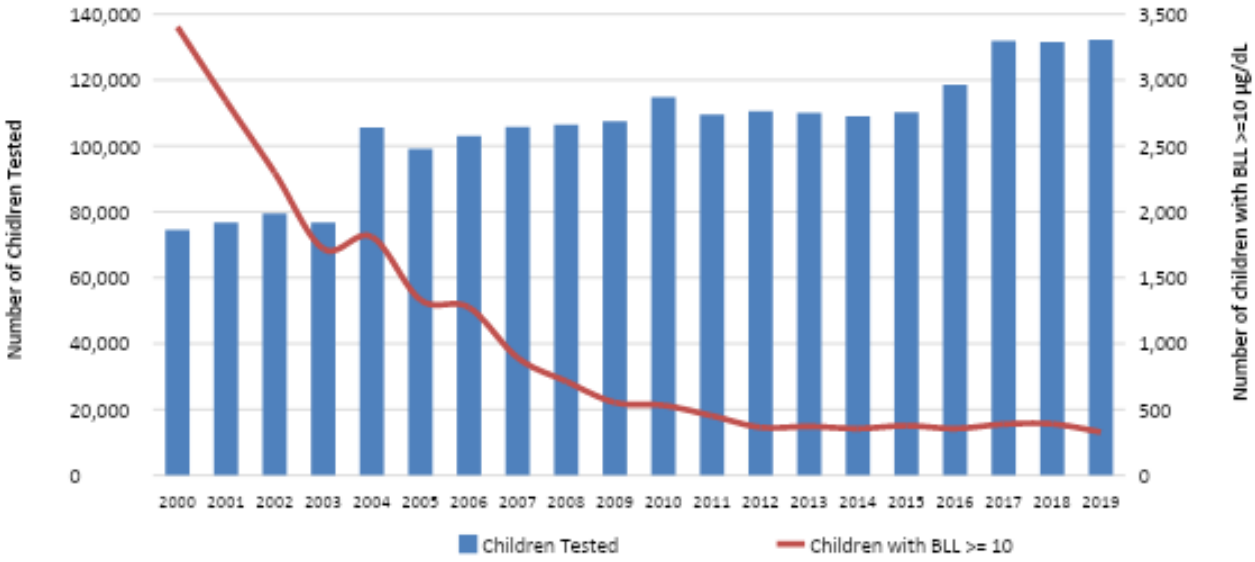
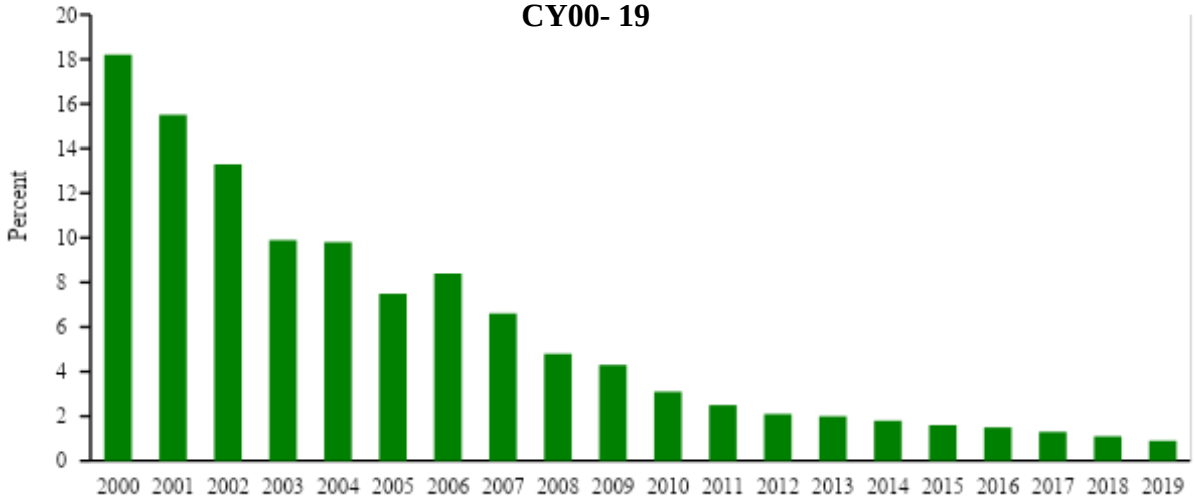


Figure One compares data from CY00-19 and illustrates how blood lead levels of ≥10 µg/dL appear to be flattening relative to data from earlier years. Figure Two illustrates that the load of lead exposure among children has declined significantly over time. In CY00, approximately 18% of children 0-72 months of age tested for lead were identified with a blood lead level between 5-9 µg/dL. In CY19, this declined to just under 1%.

Figure Two

Percent of Children 0-72 Months of Age Lead Tested and Identified with a Blood Lead Level of 5-9 µg/dL CY00- 19



The Impact of Universal Lead Testing and Point of Care Testing

The number of clinics/establishments that used Point of Care (POC) for blood lead testing in CY19 (116) remained consistent with CY18 (119). Approximately 40% of blood lead results reported to the CLR in CY19 were hard copy (e.g., fax, mail). Of that amount, 67.5% were from clinics or establishments using POC testing. The remaining 32.5% were from draw sites for commercial laboratories.

The impact of the "Universal Lead Testing" initiative continued in CY19. Table Two shows a significant increase in the number of children 0-72 months tested from CY16-19 compared to the average number of children who were tested from CY10-15 (an average of 16% increase). The increase in testing can also be attributed to the implementation of POC Testing, where children are tested in office instead of going to a laboratory draw site.

Table Two

Number of Blood Lead Test of Children 0-72 Months
CY16-19

2010-2015 (average)	2016	2017	2018	2019
110,705	118,619	131,832	131,621	132,224

The most significant increase in lead testing has been among children aged one and two years, which were the focus of the "Universal Lead Testing" initiative. Approximately 70% (69.7%) of children who were tested for lead in CY19 were one or two years of age, which is slightly higher than in previous years CY16 (68.4%), CY17 (68.8%), and CY18 (68.7%). Overall, the percentages of children aged one and two years tested for lead increased every year since March 2016, when the universal testing initiative began. (Figure Three).

Figure Three

% of Children One and Two Years of Age
Tested for Lead CY00-19

The percent of children aged one and two years tested for lead CY17-19 by jurisdiction is illustrated in Table Three. Table Four details blood lead testing for all children 0-72 months of age by jurisdiction in CY19.

Table Three

Percent of Children Aged One and Two Years Tested for Lead CY17-19

Jurisdiction	One Year Old			Two Years Old		
	2017	2018	2019	2017	2018	2019
Allegany	61.0	63.2	63.9	57.2	57.2	54.6
Anne Arundel	58.2	57.8	57.4	49.0	51.3	53.9
Baltimore	55.5	55.0	55.7	52.3	52.1	53.5
Baltimore City	53.9	50.3	50.8	52.3	50.0	45.6
Calvert	35.6	42.6	43.0	23.7	29.0	33.6
Caroline	55.2	58.5	59.7	51.2	52.2	52.2
Carroll	51.9	51.2	59.2	37.3	48.7	46.6
Cecil	41.4	42.5	39.0	25.6	27.3	25.4
Charles	43.6	52.9	56.0	37.5	40.3	38.9
Dorchester	54.8	47.7	51.4	45.2	48.4	45.8
Frederick	61.9	61.0	63.6	49.1	49.6	49.7
Garrett	45.8	42.3	55.8	38.7	35.6	36.2
Harford	47.7	45.1	46.0	42.0	48.2	46.4
Howard	55.5	53.7	53.9	42.5	46.0	45.8
Kent	36.0	32.8	33.0	28.9	29.2	22.6
Montgomery	51.4	47.7	47.9	49.9	52.4	50.2
Prince George's	47.6	44.7	46.3	43.6	42.0	43.2
Queen Anne's	47.2	54.7	60.8	43.5	46.3	49.4
Saint Mary's	42.6	41.6	48.7	24.3	25.1	29.9
Somerset	60.9	46.6	51.4	51.5	50.7	42.5
Talbot	56.7	61.3	57.5	52.4	48.8	58.6
Washington	46.1	44.9	48.1	40.8	39.5	38.4
Wicomico	59.3	55.6	53.5	55.3	52.3	52.6
Worcester	66.2	54.0	60.4	59.2	59.2	54.4
Statewide	52.2	50.5	51.6	46.6	47.5	47.2

Table Four

Blood Lead Testing of Children 0-72 Months by Jurisdiction in CY19[1]

County	Population of Children[2]	Children Tested		Blood Lead Level ≥ 5 µg/dL				Blood Lead Level 5-9 µg/dL				Blood Lead Level ≥10 µg/dL			
				Incidence[3]		Prevalence[4]		Incidence[3]		Prevalence[4]		Incidence[3]		Prevalence[4]	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Allegany	5,309	1,167	22.0	17	1.5	30	2.6	15	1.3	26	2.2	2	0.2	4	0.3
Anne Arundel	52,733	12,909	24.5	48	0.4	57	0.4	34	0.3	42	0.3	14	0.1	15	0.1
Baltimore	73,455	18,369	25.0	143	0.8	179	1.0	114	0.6	140	0.8	29	0.2	39	0.2
Baltimore City	61,897	15,526	25.1	386	2.5	560	3.6	304	2.0	446	2.9	82	0.5	114	0.7
Calvert	7,837	1,332	17.0	1	0.1	3	0.2	1	0.1	3	0.2	0	0.0	0	0.0
Caroline	3,542	802	22.6	13	1.6	15	1.9	11	1.4	11	1.4	2	0.2	4	0.5
Carroll	14,287	2,918	20.4	27	0.9	31	1.1	21	0.7	24	0.8	6	0.2	7	0.2
Cecil	9,894	1,615	16.3	24	1.5	27	1.7	23	1.4	26	1.6	1	0.1	1	0.1
Charles	14,491	3,003	20.7	14	0.5	16	0.5	13	0.4	15	0.5	1	0.0	1	0.0
Dorchester	3,059	624	20.4	5	0.8	9	1.4	4	0.6	7	1.1	1	0.2	2	0.3
Frederick	22,943	5,456	23.8	22	0.4	30	0.5	18	0.3	25	0.5	4	0.1	5	0.1
Garrett	2,441	450	18.4	6	1.3	7	1.6	6	1.3	7	1.6	0	0.0	0	0.0
Harford	23,076	4,966	21.5	35	0.7	38	0.8	26	0.5	28	0.6	9	0.2	10	0.2
Howard	27,028	6,151	22.8	39	0.6	51	0.8	31	0.5	41	0.7	8	0.1	10	0.2
Kent	1,542	204	13.2	1	0.5	2	1.0	0	0.0	1	0.5	1	0.5	1	0.5
Montgomery	97,486	24,880	25.5	140	0.6	164	0.7	105	0.4	125	0.5	35	0.1	39	0.2
Prince George's	88,767	21,958	24.7	148	0.7	188	0.9	106	0.5	136	0.6	42	0.2	52	0.2
Queen Anne's	4,235	1,001	23.6	5	0.5	6	0.6	5	0.5	6	0.6	0	0.0	0	0.0
Saint Mary's	11,611	2,063	17.8	15	0.7	17	0.8	14	0.7	15	0.7	1	0.0	2	0.1
Somerset	1,943	439	22.6	3	0.7	3	0.7	3	0.7	3	0.7	0	0.0	0	0.0
Talbot	2,902	680	23.4	10	1.5	15	2.2	7	1.0	11	1.6	3	0.4	4	0.6
Washington	13,880	2,784	20.1	26	0.9	36	1.3	17	0.6	26	0.9	9	0.3	10	0.4
Wicomico	9,380	2,112	22.5	21	1.0	30	1.4	16	0.8	24	1.1	5	0.2	6	0.3
Worcester	3,547	815	23.0	10	1.2	12	1.5	8	1.0	10	1.2	2	0.2	2	0.2
Statewide	557,285	132,224	23.7	1,159	0.9	1,526	1.2	902	0.7	1,198	0.9	257	0.2	328	0.2

1. Table is based on the selection of the highest blood lead test for each child in CY19 in the order of venous, unknown, or capillary.
2. Adapted from Maryland census population 2010 provided by the Maryland Data Center, Maryland Department of Planning, planning.maryland.gov/msdc
3. Number of new cases with a given blood lead level in CY19. These subjects were either not tested before or the level of their blood lead tests were below that given level.
4. Number of cases with a given blood lead level in CY19. Some of these subjects may have had one or more blood lead tests in the past with the same or above that blood lead level.
5. The criteria for the selection of incident or prevalent case may not necessarily match the criteria for an "Environmental Investigation".

Data Quality

The CLR is maintained in the "Systematic Tracking of Elevated Lead Levels and Remediation" (STELLAR) surveillance system, obtained from the Centers for Disease Control's (CDC), Lead Poisoning Prevention Program. The program staff work to improve data quality with respect to completeness, timeliness, and accuracy. MDE staff keep daily track of reporting to make sure establishments are reporting all blood lead tests no later than biweekly. In CY19, blood lead results ε20 ⌈g/dL were required to be reported to the Department within 24 hours after the result is known. However, upon MDE's request, laboratories/clinics agreed to report the result of all blood lead tests ε10 ⌈g/dL within 24 hours. Effective July 1, 2020 the laboratory regulations were amended to be more consistent with the newly established lower reference level, currently at ε5 ⌈g/dL in Maryland as follows:

A laboratory shall report the result of a blood lead level test to the Department by facsimile or other manner required by the Department within the following time frames:

(1) By the close of business of the next business day following a final blood lead level test result of greater than or equal to the reference level; and

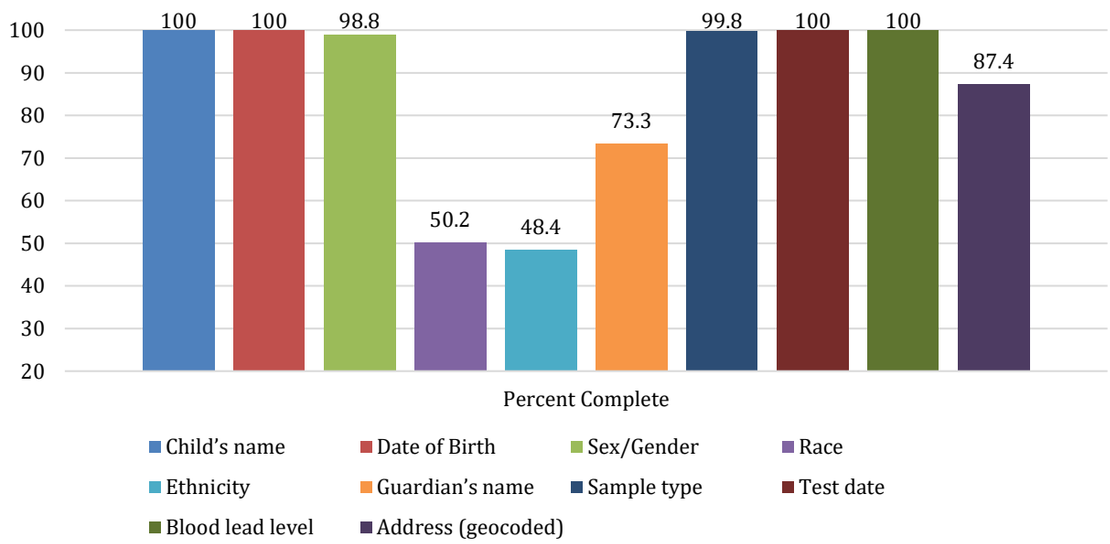
(2) Within 2 weeks of a final blood lead level test result of less than the reference level.

In CY19, a total of 141 clinics/laboratories reported blood lead tests to the CLR. The number of tests reported for each clinic/laboratory ranged from 12 to 58,845. It should be noted that the number of establishments that report during any current year may increase or decrease based on their decision to continue performing analysis of blood lead samples. Of the 141 clinics/laboratories that sent reports to the CLR, five establishments sent their reports electronically, comprising 59.3% of all reports. The remaining 40.7% reports were sent to MDE in hard copy (e.g., mail, fax). These reports were manually data entered and then electronically uploaded to the CLR.

Since 2016, there has been a decrease in the percentage of electronic blood lead reporting. The drop can partially be attributed to an increase in the number of establishments (clinics) using POC to do blood lead tests. At this time, POC test results cannot be sent electronically to the CLR. Another reason for the decrease in electronic reporting is that there are some new laboratories that send reports in a format, which the CLR cannot process electronically. Figure Four displays a summary of the completeness of data in blood lead reports for CY19. Completeness of data does not necessarily mean accuracy of the data.

Figure Four

Completeness of Demographic Information in Laboratory Reporting CY19

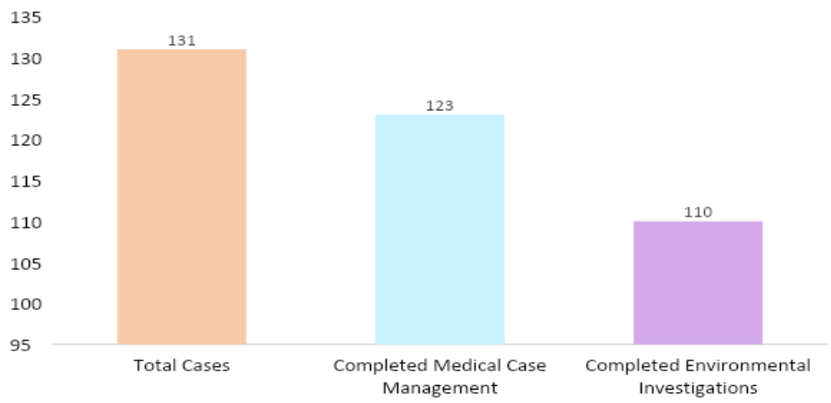


Medical and Environmental Case Management

In CY19, the Maryland's Case Management Guidelines ("Guidelines") required medical case management when a child aged 0-72 months was identified with a first time venous or two capillary blood lead tests of ≥10 µg/dL within 12 weeks of each other. On July 1, 2020, new regulations became effective that now require case management when a child aged 0-72 months is identified with a blood lead level at the new reference level of ≥5 µg/dL. Case management consists of comprehensive medical and environmental case management, coordinated between the health care provider, local health department, and MDE. Services include outreach and education to the family of the identified child, a comprehensive environmental investigation to identify all potential sources of lead exposure, recommendations for lead hazard remediation, and compliance and enforcement as needed on pre-1978 residential rental units. Identifying all potential sources of lead in the child's environment and preventing further exposure are the most important factors in case management. All home visits are arranged with the family based on the availability of the parent or guardian and in accordance with recommendations identified in the Guidelines.

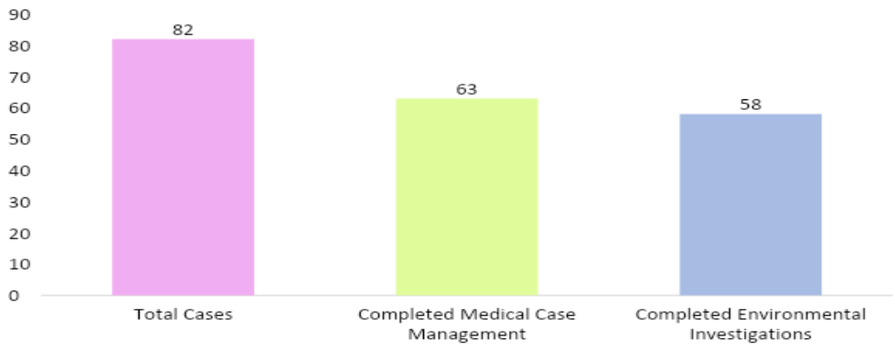
During CY19, there were 131 new cases of children aged 0-72 months identified with blood lead levels of ≥10 µg/dL in Maryland counties (excluding Baltimore City). This was five fewer cases compared to the 136 new cases in Maryland counties during CY18. Figure Five illustrates the medical and environmental case management outcomes for the new cases in the counties in CY19. Of the 131 total cases, medical case management was completed on 123 (94%) of the new cases. Environmental investigations were completed on 110 (85%) of the new cases. Though every effort is made by the MDE staff to make joint visits with the local health department nurses, this is not always possible. Those families that did not receive medical or environmental case management either refused intervention, moved prior to contact or contact could not be made after many attempts.

Figure Five
Medical and Environmental Case Management Outcomes Maryland Counties CY19



During CY19, there were 82 new cases of children aged 0-72 months identified with blood lead levels of ≥10 µg/dL in Baltimore City. This was 17 fewer cases compared to the 99 new cases during CY18. Figure Six illustrates the medical case management outcomes for new cases in Baltimore City in CY19. Of the 82 total cases, medical case management was completed on 63 (77%) of the new cases. Environmental investigations were completed on 58 (71%) of the new cases. Like the Maryland counties, the Baltimore City Health Department medical and environmental staff make every effort to perform joint visits when possible. Similarly, those families that did not receive medical or environmental case management either refused intervention, moved prior to contact or contact could not be made after many attempts.

Figure Six
Medical and Environmental
Lead Case Management Outcomes
Baltimore City CY19



Property Details: Environmental Investigations

In CY19, when a child under the age of 6 years old was diagnosed as a with a blood lead level of ≥10 µg/dL and resided or frequented a pre-1978 residential rental property (Affected Property), MDE or the local health department was required to send a Notice of Elevated Blood Level (EBL) the rental owner. The Notice of EBL notified the owner of an Affected Property that a child or a pregnant woman living in the property was diagnosed with an EBL. This required the rental owner to meet the modified lead risk reduction (MRR) standard, by performing certain lead hazard reduction treatments and obtaining a new MRR lead inspection certificate within 30 days of receiving a Notice of EBL. The rental property owner could also provide for the temporary or permanent relocation of the family to a lead safe or lead-free property within 30 days of receipt of the Notice of EBL. Maryland passed the Maryland Healthy Children Act in 2019. The law lowered the blood lead level that defines EBL from ≥10 µg/dL to ≥5 µg/dL, matching the current CDC blood lead reference level. On July 1, 2020, the events that trigger the MRR standard changed. Effective July 1, 2020, a Notice of EBL no longer triggers the MRR standard. A Notice of Defect will now serve as the trigger for the rental owner to meet the MRR standard. Table Five lists the property type of each environmental Investigation by jurisdiction.

Table Five

Property Type by County
Calendar Year 2019

	Total Environmental Investigations	Owner-Occupied						Rental Property					
		Pre-50		1950-1977		Post-1977		Pre-1950		1950-1977		Post-1977	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Allegany	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
Anne Arundel	2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	100.0
Baltimore	20	6	30.0	4	20.0	0	0.0	4	20.0	6	30.0	0	0.0
Calvert	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Caroline	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Carroll	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
Cecil	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Charles	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0
Dorchester	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Frederick	3	1	33.3	0	0.0	1	33.3	1	33.3	0	0.0	0	0.0
Garrett	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0
Harford	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
Howard	5	0	0.0	0	0.0	3	60.0	0	0.0	0	0.0	2	40.0
Kent	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0
Montgomery	22	1	4.5	0	0.0	8	36.4	1	4.5	8	36.4	4	18.1
Prince George's	38	6	15.8	5	13.2	1	2.6	5	13.2	18	47.3	3	7.9
Queen Anne's	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Saint Mary's	1	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0
Somerset	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Talbot	2	0	0.0	0	0.0	0	0.0	1	50.0	1	50.0	0	0.0
Washington	7	3	42.9	0	0.0	0	0.0	3	42.9	1	14.3	0	0.0
Wicomico	3	1	33.3	1	33.3	0	0.0	1	33.3	0	0.0	0	0.0
Worcester	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
County Total*	**110**	**20**	**18.1**	**11**	**10.0**	**13**	**11.8**	**19**	**17.3**	**34**	**31.0**	**13**	**11.8**
Baltimore City	**58**	**23**	**39.7**	**1**	**1.7**	**1**	**1.7**	**31**	**53.4**	**2**	**3.4**	**0**	**0.0**

Sources of Lead Identified CY19

An environmental investigation may identify multiple lead sources in a child's environment. There may also be instances when the accredited lead risk assessor is unable to determine a source of lead exposure. Figure Seven illustrates the distribution of lead hazards that were identified during environmental investigations statewide. Table Six lists all lead hazards identified during completed environmental investigations by county for CY16-CY19.

Figure Seven

Distribution of Lead Sources by County
CY 2019

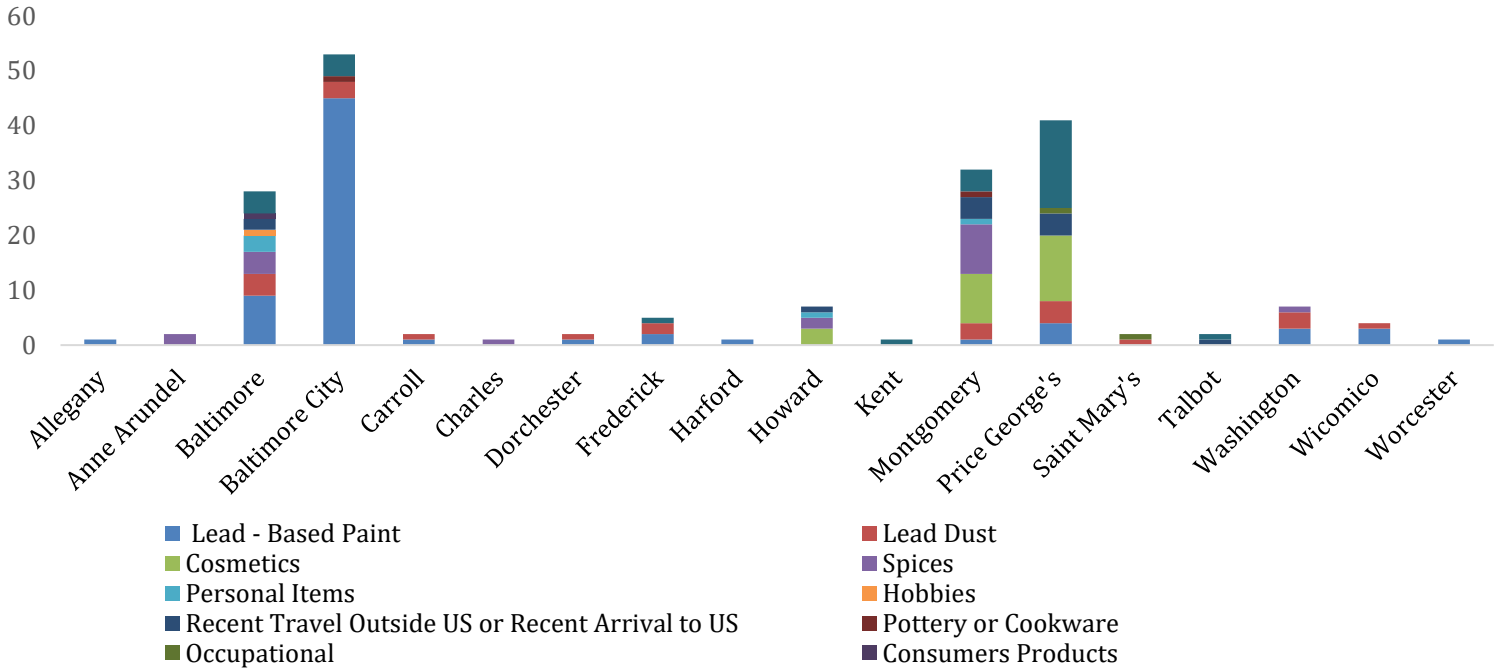


Table Six
Lead Hazards Identified by County
CY 2016-2019

County	Total Environmental Investigations	Total Hazards	Lead Paint	Lead Dust	Water Soil	Cosmetics	Spices	Personal Items	Hobbies	Recent Travel Outside US or Recent Arrival to US	Pottery or Cookware	Occupational	Consumers Products	Unable to Determine
Allegany	18	25	13	9	3	0	0	0	0	0	0	0	0	0
Anne Arundel	28	33	3	3	0	4	14	0	4	5	0	0	0	0
Baltimore	102	146	31	15	2	2	35	13	6	22	0	0	1	19
Calvert	2	5	1	1	0	0	0	0	2	1	0	0	0	0
Caroline	7	7	1	1	1	0	0	0	1	0	0	0	0	3
Carroll	9	17	6	6	1	0	0	1	0	1	0	0	0	2
Cecil	4	4	0	0	1	0	0	2	1	0	0	0	0	0
Charles	8	7	1	1	0	0	3	0	2	0	0	0	0	1
Dorchester	10	17	9	7	0	0	0	0	0	0	0	0	0	1
Frederick	18	28	7	6	1	2	3	4	1	3	0	0	0	1
Garret	1	1	0	0	0	0	0	0	1	0	0	0	0	0
Harford	7	8	4	2	1	0	1	0	0	0	0	0	0	0
Howard	31	54	2	0	0	12	20	6	0	12	0	0	0	2
Kent	2	2	0	0	0	1	0	0	0	0	0	0	0	1
Montgomery	77	96	3	4	3	9	31	5	2	27	1	0	0	11
Prince George's	171	182	11	8	2	12	5	5	3	84	0	1	0	51
Queen Anne's	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Saint Mary's	2	4	0	1	0	1	1	0	0	0	0	1	0	0
Somerset	4	4	3	0	0	0	0	0	0	1	0	0	0	0
Talbot	8	10	3	1	1	0	0	0	2	1	0	0	0	2
Washington	28	33	13	9	1	1	2	2	0	1	0	0	0	4
Wicomico	18	25	13	6	2	0	0	0	3	0	0	0	0	1
Worcester	5	7	3	1	0	0	0	1	1	0	0	0	0	1
Totals Counties	**561**	**716**	**128**	**81**	**19**	**44**	**115**	**39**	**29**	**158**	**1**	**2**	**1**	**100**
Baltimore City	**246**	**246**	**190**	**7**	**2**	**0**	**0**	**9**	**2**	**3**	**3**	**0**	**0**	**30**

Figures Eight and Nine break down the percentage of lead hazards identified during the 110 completed environmental investigations in Maryland counties. Separate pie charts are provided based on housing types and built date.

Figure Eight

Lead Hazards Identified in Owner- Occupied Housing
Maryland Counties CY19

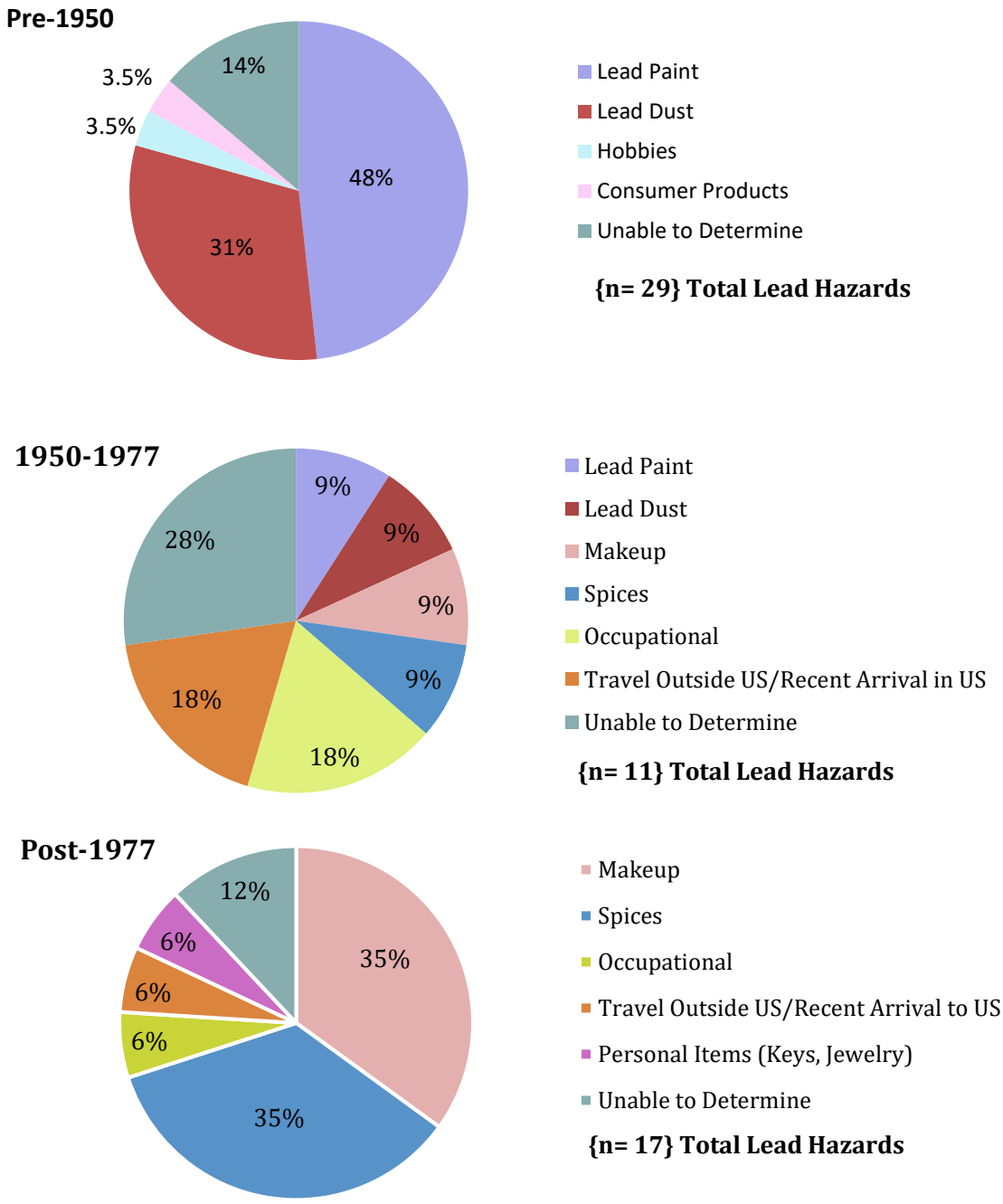
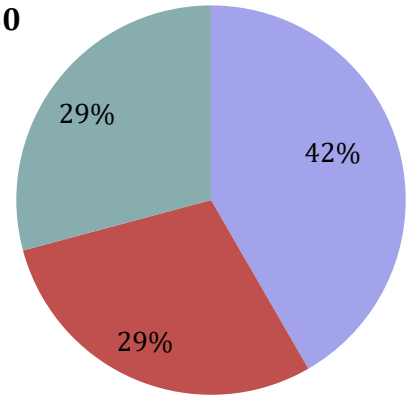


Figure Nine
Lead Hazards Identified in Rental Housing
Maryland Counties CY19

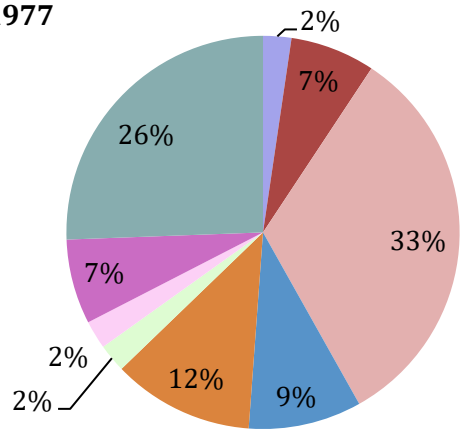
Pre-1950



Lead Paint
Lead Dust

{n= 24} Total Lead Hazards

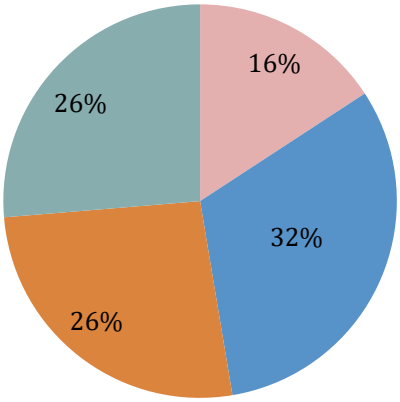
1950-1977



Lead Paint
Lead Dust
Makeup
Spices
Travel Outside US/Recent Arrival to US
Cookware/Pottery
Consumer Products
Personal Items (Keys, Jewelry)
Unable to Determine

{n=42} Total Lead Hazards

Post - 1977



Makeup
Spices
Travel Outside US/Recent Arrival to US
Unable to Determine

{n=19} Total Lead Hazards

Figures Ten and Eleven break down the percentage of lead hazards identified during the 58 completed environmental investigations in Baltimore City. Separate pie charts are provided based on housing types and built date.

Figure Ten

Lead Hazards Identified in Owner Occupied Housing
Baltimore City CY19

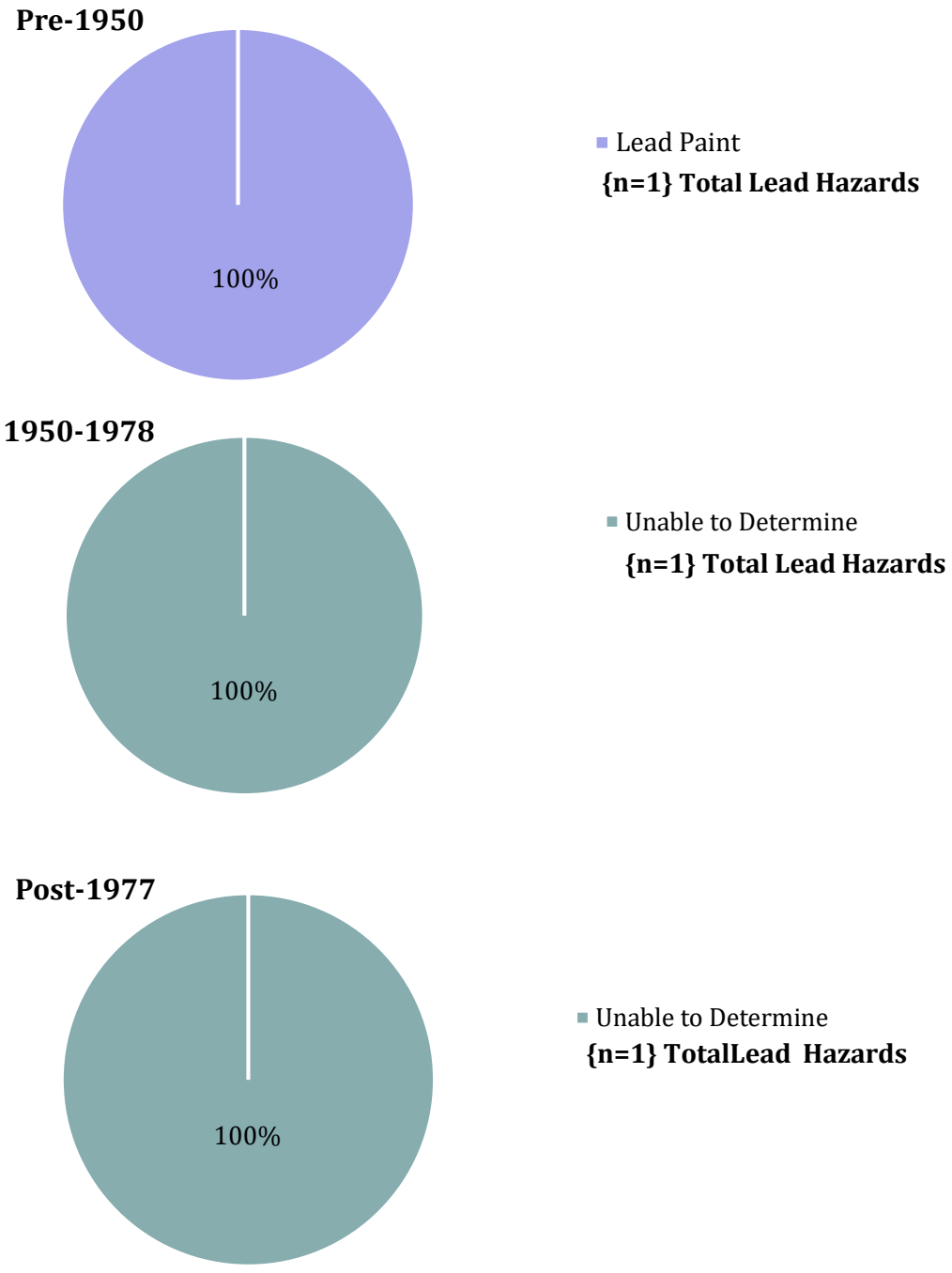
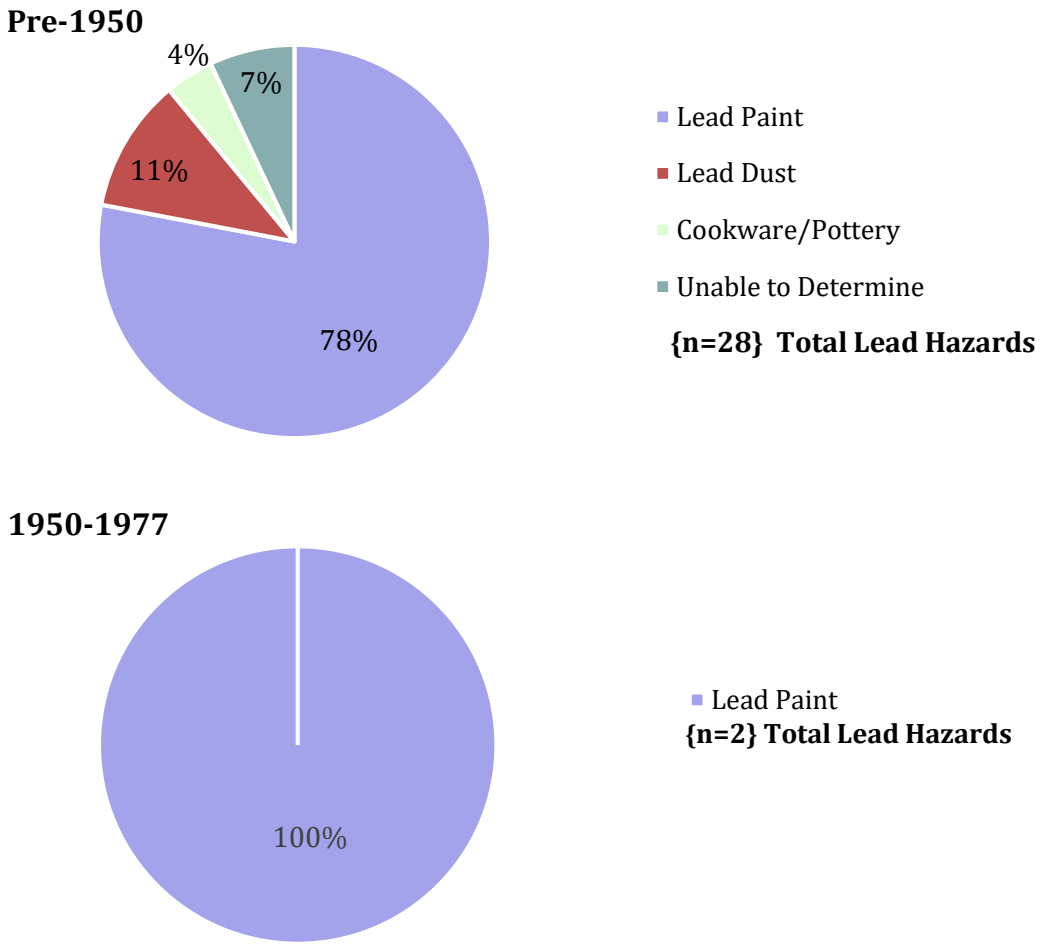


Figure Eleven
Lead Hazards Identified in Rental Housing
Baltimore City CY19



Conclusion: Housing and Lead Hazards in Maryland

An important distinction may be made when comparing lead hazards identified during environmental investigations in Baltimore City and those identified in other counties in Maryland. Historically, lead-based paint hazards are the single most significant factor in lead exposure for children aged 0-72 months in Baltimore City. Baltimore has one of the largest inventories of old housing stock of any major city in America. Of the more than 260,000 occupied properties in Maryland built prior to 1950, 40% are in Baltimore City (*American Community Survey, 2018 5Year Estimates*). Of the 58 properties inspected in Baltimore City, 54 (93%) were built prior to 1950. Of those 54 properties, lead-based paint hazards (including dust hazards) were identified as a potential source of lead exposure in 94% of the properties inspected. Of the 110 properties inspected in the remaining counties, 39 (35%) were built prior to 1950. Of those 39 properties, lead based paint hazards (including dust hazards) were identified as a potential source of the lead exposure in 75% of the properties inspected. From this data we may conclude that lead-based paint hazards (including dust hazards) were the most significant lead hazards identified in pre-1950 housing statewide in CY19.

Of the 58 properties inspected in Baltimore City, four (7%) were built prior after 1949. Of those properties, lead-based paint hazards (including dust hazards) were identified as a potential source of lead exposure in 50% of the properties inspected. Of the 110 properties inspected in the remaining counties, 71 (65%) were built after 1949. Of those properties, lead based paint hazards (including dust hazards) were identified as a potential source of the lead exposure in 10% of the properties inspected. Though lead-based paint hazards are still a significant potential source in Baltimore City properties built after 1949, this is not true for the remainder of the state, where 90% of potential lead hazards were identified as something other than defective lead-based paint or leaded dust.

Maryland's Continued Efforts

Maryland's New Lead "Reference" Level

On July 1, 2020, the Maryland Healthy Children Act (Ch. 341) went into full effect. The law lowered the blood lead level for certain interventions from ≥10 µg/dL to the CDC reference level, currently ≥5 µg/dL. The law requires MDE or the local health department to provide case management, including environmental investigations to identify lead sources, when a child is diagnosed with a blood lead level ≥ 5µg/dL. Early intervention is a key component to ensure families with children exposed to lead are provided resources to mitigate the effects of lead exposure.

Monitoring Drinking Water for Lead in Schools and Child Care Centers

In 2017, House Bill 270 (Testing for Lead in Drinking Water—Public and Nonpublic Schools) was signed into law by Governor Larry Hogan, and regulations became effective April 9, 2018. The law requires all public, nonpublic and charter schools in Maryland to test all drinking water outlets for the presence of lead every three years. The law requires that testing be conducted using the protocols outlined in U.S. Environmental Protection Agency's (EPA) "3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities" guidance and uses an action level of 20 ppb. As of October 6, 2020, MDE has received a total of 60,611 first-draw lead sample results from 22 public school systems, 235 nonpublic schools, and eight charter schools. Of this number, 2,516 samples (4.2%) exceeded the action level; 1,116 (1.8%) were from drinking water outlets, 1,376 (2.3%) were from non-consumption outlets and there were 24 samples (1%) for which a use determination could not be made. Most recently, MDE has received a grant under Section 2107 of the EPA's Water Improvement Infrastructure for the Nation program and will use those funds to expand lead testing to drinking water outlets in Maryland's childcare facilities.

Lowering of Lead Dust Standards

Maryland has lowered the lead in dust threshold, which impacts post-abatement clearance testing, environmental investigations and risk reduction compliance inspections. The amended regulations went into effect on July 1, 2020. These regulations are now consistent with the federal lead dust hazard standard. They are also more protective of public health and more consistent with the concept of a lower blood lead reference level.

Surface	Current Standard	New Standard
Floors	40	10
Windowsills	250	100
Window wells	400	100

Establishing New Regulations for Environmental Investigations

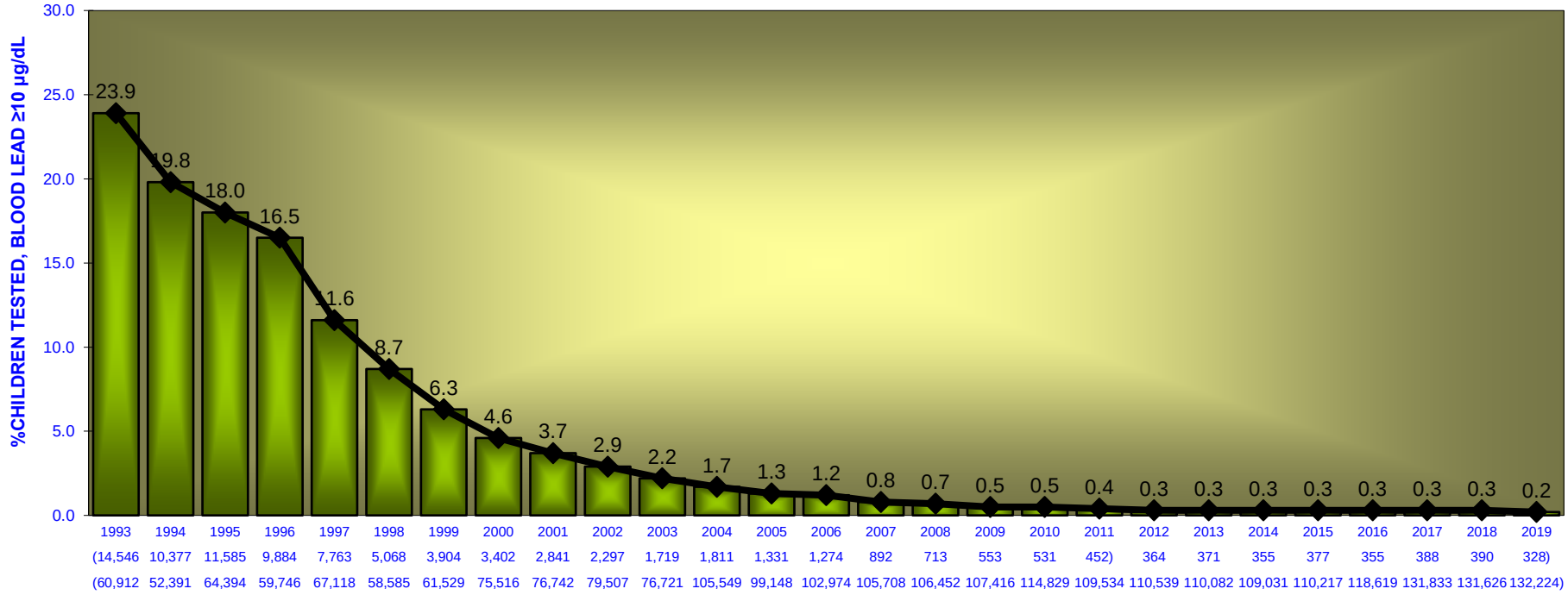
Also, part of Chapter 341, on July 1, 2020, Maryland adopted new regulations for conducting environmental investigations to determine lead hazards for children aged 0-72 months pregnant women with blood lead levels at or above the reference level. The regulations are consistent with the U.S. Department of Housing and Urban Development's Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing.

New Trigger for Meeting the Modified Risk Reduction Standard

Ch. 341 also lowered the blood lead level that defines EBL from ≥10 µg/dL to ≥5 µg/dL, matching the current CDC blood lead reference level. On July 1, 2020, the events that trigger the MRR standard changed. Effective July 1, 2020, a Notice of EBL no longer triggers the MRR standard. A Notice of Defect will now serve as the trigger for the rental owner to meet the MRR standard. To explain further: 1. MDE or a local health department is required to perform environmental investigations for a child under the age of 6 years old or pregnant woman diagnosed with a blood lead level of ≥ 5 µg/dL. If during the environmental investigation, chipping, peeling, or flaking paint is observed by the inspector and the home is an Affected Property, a Notice of Defect will be issued by MDE or the local health department. 2. Absent a diagnosis of EBL or an environmental investigation, a tenant or any other source may still issue a Notice of Defect to the owner of an Affected Property if chipping, peeling, or flaking paint exists inside and/or outside of the property.

Appendix A

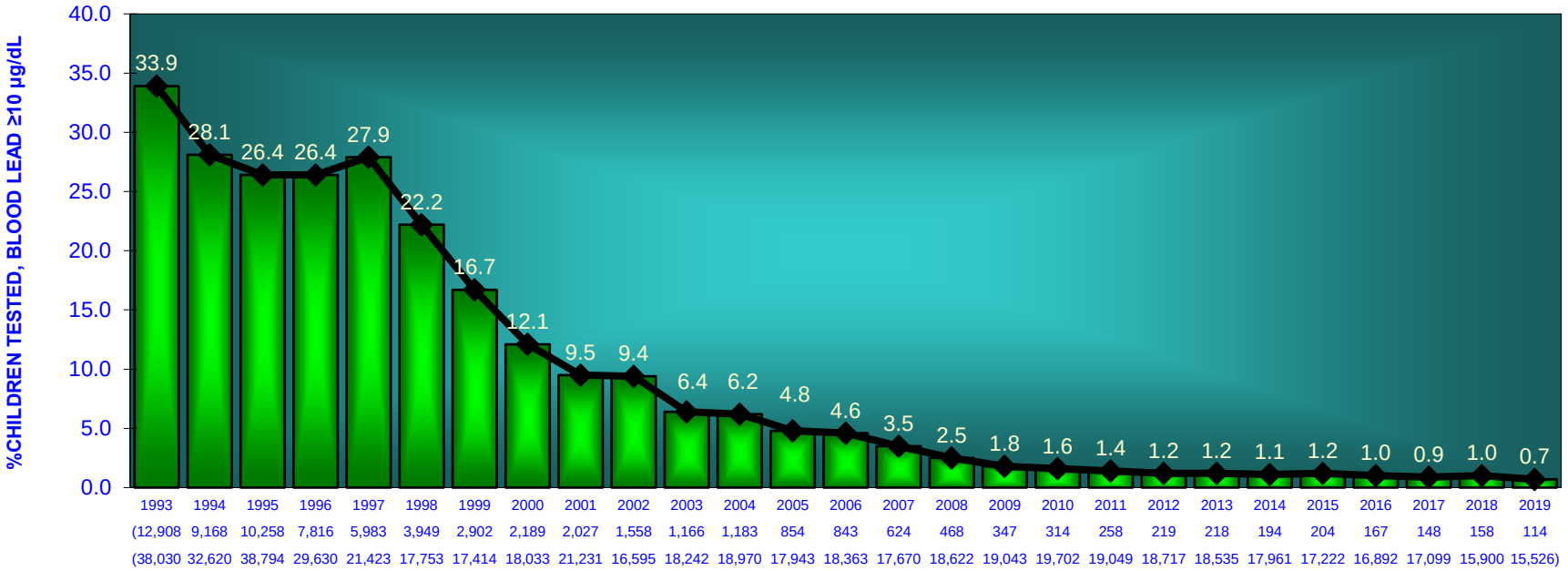
MARYLAND DEPARTMENT OF THE ENVIRONMENT
CHILDHOOD BLOOD LEAD SURVEILLANCE
STATEWIDE 1993-2019



CALENDAR YEAR
(Number of Children with BLL ≥10 µg/dL)
(Number of Children Tested)

Appendix A

MARYLAND DEPARTMENT OF THE ENVIRONMENT
CHILDHOOD BLOOD LEAD SURVEILLANCE
BALTIMORE CITY: 1993-2019



CALENDAR YEAR
(Number of Children with BLL ≥10 µg/dlL)
(Number of Children Tested)

Appendix B

Blood Lead Testing of Children One and Two Years Old by Jurisdiction in CY 2019

Age Group	Population of children	Children Tested		Blood Lead Level ≥5				Blood Lead level 5-9				Blood Lead Level ≥10			
				Incidence		Prevalence		Incidence		Prevalence		Incidence		Prevalence	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Allegany															
One Year	850	543	63.9	6	1.1	10	1.8	6	1.1	10	1.8		0.0	0	0.0
Two Years	889	485	54.6	9	1.9	15	3.1	8	1.6	13	2.7	1	0.2	2	0.4
Total	1,739	1,028	59.1	15	1.5	25	2.4	14	1.4	23	2.2	1	0.1	2	0.2
Anne Arundel															
One Year	8,900	5,112	57.4	24	0.5	26	0.5	18	0.4	19	0.4	6	0.1	7	0.1
Two Years	8,822	4,752	53.9	13	0.3	15	0.3	10	0.2	12	0.3	3	0.1	3	0.1
Total	17,722	9,864	55.7	37	0.4	41	0.4	28	0.3	31	0.3	9	0.1	10	0.1
Baltimore															
One Year	12,486	6,958	55.7	52	0.7	58	0.8	41	0.6	43	0.6	11	0.2	15	0.2
Two Years	12,172	6,512	53.5	45	0.7	54	0.8	38	0.6	45	0.7	7	0.1	9	0.1
Total	24,658	13,470	54.6	97	0.7	112	0.8	79	0.6	88	0.7	18	0.1	24	0.2
Baltimore City															
One Year	10,953	5,565	50.8	142	2.6	168	3.0	120	2.2	141	2.5	22	0.4	27	0.5
Two Years	10,542	4,807	45.6	145	3.0	190	4.0	110	2.3	147	3.1	35	0.7	43	0.9
Total	21,495	10,372	48.3	287	2.8	358	3.5	230	2.2	288	2.8	57	0.5	70	0.7
Calvert															
One Year	1,222	526	43.0	1	0.2	2	0.4	1	0.2	2	0.4		0.0	0	0.0
Two Years	1,253	421	33.6	0	0.0	1	0.2		0.0	1	0.2		0.0	0	0.0
Total	2,475	947	38.3	1	0.1	3	0.3	1	0.1	3	0.3	0	0.0	0	0.0
Caroline															
One Year	575	343	59.7	4	1.2	4	1.2	3	0.9	3	0.9	1	0.3	1	0.3
Two Years	581	303	52.2	6	2.0	6	2.0	6	2.0	6	2.0		0.0	0	0.0
Total	1,156	646	55.9	10	1.5	10	1.5	9	1.4	9	1.4	1	0.2	1	0.2

Appendix B

Blood Lead Testing of Children One and Two Years Old by Jurisdiction in CY 2019

Age Group	Population of children	Children Tested		Blood Lead Level ≥5				Blood Lead level 5-9				Blood Lead Level ≥10			
				Incidence		Prevalence		Incidence		Prevalence		Incidence		Prevalence	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Carroll															
One Year	2,209	1,307	59.2	12	0.9	13	1.0	10	0.8	11	0.8	2	0.2	2	0.2
Two Years	2,296	1,071	46.6	7	0.7	9	0.8	4	0.4	5	0.5	3	0.3	4	0.4
Total	4,505	2,378	52.8	19	0.8	22	0.9	14	0.6	16	0.7	5	0.2	6	0.3
Cecil															
One Year	1,683	657	39.0	8	1.2	8	1.2	8	1.2	8	1.2		0.0	0	0.0
Two Years	1,640	416	25.4	11	2.6	11	2.6	11	2.6	11	2.6		0.0	0	0.0
Total	3,323	1,073	32.3	19	1.8	19	1.8	19	1.8	19	1.8	0	0.0	0	0.0
Charles															
One Year	2,322	1,300	56.0	5	0.4	5	0.4	5	0.4	5	0.4		0.0	0	0.0
Two Years	2,515	979	38.9	8	0.8	10	1.0	8	0.8	10	1.0		0.0	0	0.0
Total	4,837	2,279	47.1	13	0.6	15	0.7	13	0.6	15	0.7	0	0.0	0	0.0
Dorchester															
One Year	517	264	51.1	3	1.1	3	1.1	3	1.1	3	1.1		0.0	0	0.0
Two Years	524	240	45.8	1	0.4	1	0.4	1	0.4	1	0.4		0.0	0	0.0
Total	1,041	504	48.4	4	0.8	4	0.8	4	0.8	4	0.8	0	0.0	0	0.0
Frederick															
One Year	3,625	2,305	63.6	11	0.5	12	0.5	10	0.4	11	0.5	1	0.0	1	0.0
Two Years	3,848	1,914	49.7	5	0.3	7	0.4	3	0.2	5	0.3	2	0.1	2	0.1
Total	7,473	4,219	56.5	16	0.4	19	0.5	13	0.3	16	0.4	3	0.1	3	0.1
Garrett															
One Year	362	202	55.8	2	1.0	2	1.0	2	1.0	2	1.0		0.0	0	0.0
Two Years	409	148	36.2	0	0.0	1	0.7		0.0	1	0.7		0.0	0	0.0
Total	771	350	45.4	2	0.6	3	0.9	2	0.6	3	0.9	0	0.0	0	0.0

Appendix B

Blood Lead Testing of Children One and Two Years Old by Jurisdiction in CY 2019

Age Group	Population of children	Children Tested		Blood Lead Level ≥5				Blood Lead level 5-9				Blood Lead Level ≥10			
				Incidence		Prevalence		Incidence		Prevalence		Incidence		Prevalence	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Harford															
One Year	3,765	1,731	46.0	10	0.6	11	0.6	7	0.4	8	0.5	3	0.2	3	0.2
Two Years	3,793	1,759	46.4	9	0.5	10	0.6	6	0.3	7	0.4	3	0.2	3	0.2
Total	7,558	3,490	46.2	19	0.5	21	0.6	13	0.4	15	0.4	6	0.2	6	0.2
Howard															
One Year	4,262	2,299	53.9	16	0.7	19	0.8	16	0.7	18	0.8		0.0	1	0.0
Two Years	4,517	2,071	45.8	14	0.7	17	0.8	9	0.4	12	0.6	5	0.2	5	0.2
Total	8,779	4,370	49.8	30	0.7	36	0.8	25	0.6	30	0.7	5	0.1	6	0.1
Kent															
One Year	261	86	33.0	0	0.0	0	0.0		0.0	0	0.0		0.0	0	0.0
Two Years	243	55	22.6	1	1.8	1	1.8		0.0	0	0.0	1	1.8	1	1.8
Total	504	141	28.0	1	0.7	1	0.7	0	0.0	0	0.0	1	0.7	1	0.7
Montgomery															
One Year	16,265	7,798	47.9	51	0.7	54	0.7	38	0.5	41	0.5	13	0.2	13	0.2
Two Years	16,354	8,214	50.2	31	0.4	35	0.4	22	0.3	25	0.3	9	0.1	10	0.1
Total	32,619	16,012	49.1	82	0.5	89	0.6	60	0.4	66	0.4	22	0.1	23	0.1
Prince George's															
One Year	15,124	7,007	46.3	51	0.7	59	0.8	33	0.5	40	0.6	18	0.3	19	0.3
Two Years	14,858	6,420	43.2	41	0.6	53	0.8	32	0.5	41	0.6	9	0.1	12	0.2
Total	29,982	13,427	44.8	92	0.7	112	0.8	65	0.5	81	0.6	27	0.2	31	0.2
Queen Anne's															
One Year	671	408	60.8	2	0.5	2	0.5	2	0.5	2	0.5		0.0	0	0.0
Two Years	676	334	49.4	1	0.3	2	0.6	1	0.3	2	0.6		0.0	0	0.0
Total	1,347	742	55.1	3	0.4	4	0.5	3	0.4	4	0.5	0	0.0	0	0.0

Appendix B

Blood Lead Testing of Children One and Two Years Old by Jurisdiction in CY 2019

Age Group	Population of children	Children Tested		Blood Lead Level ≥5				Blood Lead level 5-9				Blood Lead Level ≥10			
				Incidence		Prevalence		Incidence		Prevalence		Incidence		Prevalence	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Saint Mary's															
One Year	1,894	923	48.7	7	0.8	8	0.9	7	0.8	7	0.8		0.0	1	0.1
Two Years	1,897	568	29.9	5	0.9	6	1.1	5	0.9	6	1.1		0.0	0	0.0
Total	3,791	1,491	39.3	12	0.8	14	0.9	12	0.8	13	0.9	0	0.0	1	0.1
Somerset															
One Year	329	169	51.4	2	1.2	2	1.2	2	1.2	2	1.2		0.0	0	0.0
Two Years	348	148	42.5	0	0.0	0	0.0		0.0	0	0.0		0.0	0	0.0
Total	677	317	46.8	2	0.6	2	0.6	2	0.6	2	0.6	0	0.0	0	0.0
Talbot															
One Year	510	293	57.5	5	1.7	7	2.4	5	1.7	6	2.0		0.0	1	0.3
Two Years	507	297	58.6	2	0.7	3	1.0	1	0.3	2	0.7	1	0.3	1	0.3
Total	1,017	590	58.0	7	1.2	10	1.7	6	1.0	8	1.4	1	0.2	2	0.3
Washington															
One Year	2,241	1,079	48.1	12	1.1	12	1.1	11	1.0	11	1.0	1	0.1	1	0.1
Two Years	2,344	901	38.4	6	0.7	11	1.2	2	0.2	6	0.7	4	0.4	5	0.6
Total	4,585	1,980	43.2	18	0.9	23	1.2	13	0.7	17	0.9	5	0.3	6	0.3
Wicomico															
One Year	1,611	862	53.5	9	1.0	9	1.0	7	0.8	7	0.8	2	0.2	2	0.2
Two Years	1,564	822	52.6	9	1.1	12	1.5	8	1.0	11	1.3	1	0.1	1	0.1
Total	3,175	1,684	53.0	18	1.1	21	1.2	15	0.9	18	1.1	3	0.2	3	0.2
Worcester															
One Year	599	362	60.4	5	1.4	6	1.7	4	1.1	5	1.4	1	0.3	1	0.3
Two Years	590	321	54.4	4	1.2	4	1.2	3	0.9	3	0.9	1	0.3	1	0.3
Total	1,189	683	57.4	9	1.3	10	1.5	7	1.0	8	1.2	2	0.3	2	0.3

Appendix B

Blood Lead Testing of Children One and Two Years Old by Jurisdiction in CY 2019

Age Group	Population of children	Children Tested		Blood Lead Level ≥5				Blood Lead level 5-9				Blood Lead Level ≥10			
				Incidence		Prevalence		Incidence		Prevalence		Incidence		Prevalence	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Statewide															
One Year	93,236	48,099	51.6	440	0.9	500	1.0	359	0.7	405	0.8	81	0.2	95	0.2
Two Years	93,182	43,958	47.2	373	0.8	474	1.1	288	0.7	372	0.8	85	0.2	102	0.2
Total	186,418	92,057	49.4	813	0.9	974	1.1	647	0.7	777	0.8	166	0.2	197	0.2