Lead Poisoning Prevention Program

Childhood Blood Lead Surveillance in Maryland

Annual Report 2020

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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MARYLAND CHILDHOOD LEAD REGISTRY
ANNUAL SURVEILLANCE REPORT 2020

Executive Summary

The Maryland Department of the Environment (MDE) statewide Childhood Lead Registry (CLR) performs childhood blood lead surveillance for the State of Maryland. The CLR receives the reports of all blood lead tests done on Maryland children 0-18 years of age, and the CLR provides blood lead test results to the Maryland Department of Health (MDH), 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, including a detailed breakdown of blood lead data by age, jurisdiction, blood lead level, incident, and prevalent cases of blood lead level ≥10 micrograms per deciliter (µg/dL), and blood lead level between 5-9 µg/dL, and the trend of blood lead level over the years. This current report presents the blood lead test results for the calendar year (CY) 2020. 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 referenced within this report pertain to children 0-72 months of age.

CY20 Surveillance Highlights

* A total of 120,936 blood lead tests from 116,142 children 0-18 years were received and processed by the CLR in 2020, of which 114,735 tests were from 110,158 children 0-72 months.

* There was a significant decrease in the number of children 0-72 months tested for lead in 2020 compared to 2019 (110,158 vs. 132,224). In fact, the number of children tested in 2020 was the lowest number since 2015. The decrease may be related to the COVID-19 pandemic, which may have reduced the use of in-person health services such as blood lead testing.

* Statewide, there was a 16.7% decrease in blood lead testing in 2020 compared to 2019. Somerset and Garrett counties had the greatest decrease in testing by percentage (35.5% and 33.8%, respectively). Queen Anne's County had the least decrease in testing in 2020 (7.2%).

* Children aged 1 and 2 years had the highest rate of blood lead testing in 2020 compared to other age groups and had the lowest decrease in testing compared to 2019.

* The number of children aged 0-72 months identified with a blood lead level (BLL) ≥10 µg/dL decreased from 328 in 2019 to 270 in 2020. While the decrease may be attributed to the overall drop in blood lead testing, the two calendar years have the same percentage (0.2%).

* The number of children 0-72 months of age identified with a blood lead level of 5-9 µg/dL decreased from 1,198 in 2019 to 901 in 2020 (24.8%).

* Overall, 1.1% of children 0-72 months who were tested in 2020 had a blood lead level of ≥5 µg/dL. This reflects a decrease from the rate of 1.2% in 2019.

* In 2020, CLR received the reports of blood lead tests from 146 entities, of which 130 were clinics or establishments doing in-office blood lead testing.

Statistical Report

In 2020, 110,158 children 0-72 months old were tested for lead exposure statewide. Table One provides a summary of statewide statistics of blood lead testing in 2020.

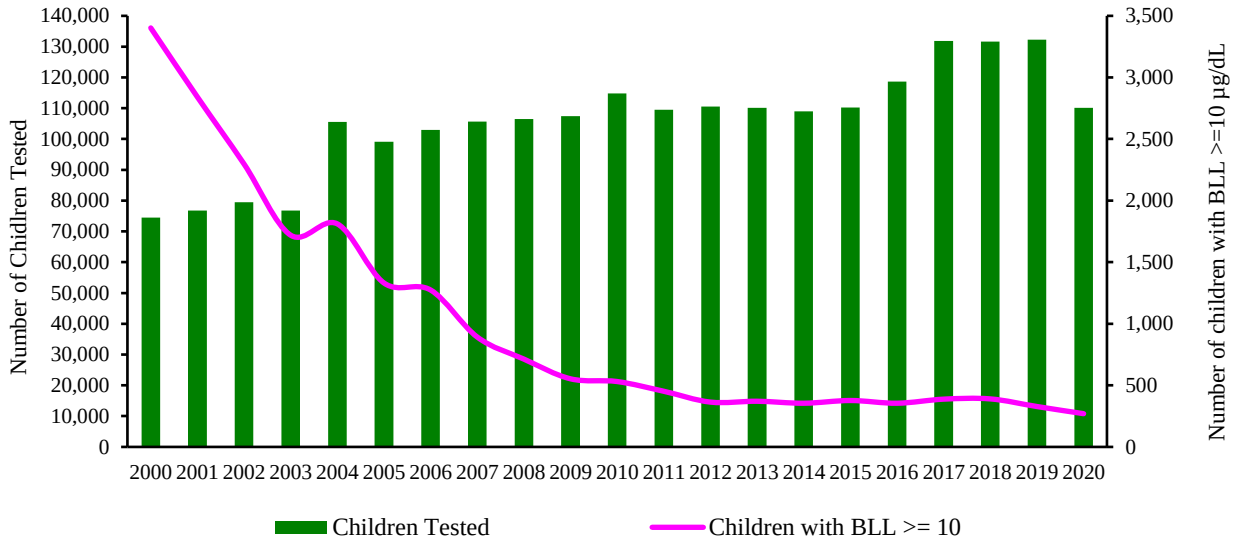
Table One: CY20 Statistical Report1

Item	Number	Percent
	All Children (0-17 Years)	
Number of Tests	120,936	
Number of Children	116,142	
	Children 0-72 Months	
Number of Tests	114,735	
Number of Children	110,158	100.0
	Age	
Under One	8,838	8.0
One Year	43,962	39.9
Two Years	38,757	35.2
Three Years	6,284	5.7
Four Years	6,942	6.3
Five Years	5,375	4.9
	Sex	
Female	52,771	47.9
Male	55,996	50.8
Undetermined	1,391	1.3
	Blood Lead Level (µg/dL)	
≤4	108,987	98.9
5-9	901	0.8
10-14	156	0.1
15-19	56	0.1
≥20	58	0.1
Mean BLL (Geometric)	1.59	
	Blood Specimen	
Capillary	51,613	46.8
Venous	58,353	53.0
Undetermined	192	0.2

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

The count of children 0-72 months tested for lead in 2020 shows a drop of 22,066 compared to 2019 (110,158 vs. 132,224). The extent of decline (16.7%) is beyond what may be considered an annual variation. The decline is likely, at least partially, a result of the impact of COVID-19, which reduced the use of routine health services. Figure one demonstrates the visible decline in blood lead testing in 2020 compared to the previous year — tables two and three present the decline in blood lead testing by age group and jurisdiction.

Figure One: Number of Children 0-72 Months Tested for Lead and Number Reported to Have Blood Lead Level 10 g/dL: 2000-2020



To further appreciate the impact of COVID-19 on blood lead testing in 2020, a linear projection based on lead testing from 2015-2019, specifies that 136,307 children 0-72 months were expected to be tested for lead in 2020, in the absence of COVID-19. With the observed number of 110,158, the magnitude of the decline is more than 19%. To address the decrease in testing, MDE continuously worked alongside the local health department lead nursing staff during the medical case management process to communicate the importance of follow-up testing to parents and guardians of persons at risk. Based on the decline in testing, MDE in partnership with the MDH, and the local health departments, increased outreach efforts in 2021. These efforts included a letter to parents, distributed through various channels, explaining the importance of testing in light of the pandemic. The letter is available here: mde.maryland.gov/programs/LAND/Documents/LeadFactSheets/Parent%20Letter%20Final%2011.17.21%20signed.pdf

Table Two: Reduction in Blood Lead Testing 2020 vs. 2019 by Age Group

Age	2019 Population of Children	2019 Children Tested Number	2019 Children Tested Percent	2020 Population of Children	2020 Children Tested Number	2020 Children Tested Percent	Decrease in 2020 Number	Decrease in 2020 Percent
Under One	93,253	10,862	11.6	93,620	8,838	9.4	2,024	18.6
One Year	93,236	48,099	51.6	93,684	43,962	46.9	4,137	8.6
Two Years	93,182	43,958	47.2	93,707	38,757	41.4	5,201	11.8
Three Years	93,003	10,867	11.7	93,606	6,284	6.7	4,583	42.2
Four Years	92,579	10,889	11.8	93,328	6,942	7.4	3,947	36.2
Five Years	92,032	7,549	8.2	92,892	5,375	5.8	2,174	28.8
Total	557,285	132,224	23.7	560,837	110,158	19.6	22,066	16.7

Table Three: Reduction in Blood Lead Testing 2020 vs. 2019 by Jurisdiction

County	2019 Population of Children	2019 Children Tested Number	2019 Children Tested Percent	2020 Population of Children	2020 Children Tested Number	2020 Children Tested Percent	Drop in 2020 Number	Drop in 2020 Percent
Allegany	5,309	1,167	22.0	5,343	976	18.3	191	16.4
Anne Arundel	52,733	12,909	24.5	53,069	11,546	21.8	1,363	10.6
Baltimore	73,455	18,369	25.0	73,922	15,074	20.4	3,295	17.9
Baltimore City	61,897	15,526	25.1	62,282	11,543	18.5	3,983	25.7
Calvert	7,837	1,332	17.0	7,889	1,092	13.8	240	18.0
Caroline	3,542	802	22.6	3,564	655	18.4	147	18.3
Carroll	14,287	2,918	20.4	14,381	2,564	17.8	354	12.1
Cecil	9,894	1,615	16.3	9,957	1,341	13.5	274	17.0
Charles	14,491	3,003	20.7	14,588	2,461	16.9	542	18.0
Dorchester	3,059	624	20.4	3,082	472	15.3	152	24.4
Frederick	22,943	5,456	23.8	23,093	4,761	20.6	695	12.7
Garrett	2,441	450	18.4	2,457	298	12.1	152	33.8
Harford	23,076	4,966	21.5	23,224	4,327	18.6	639	12.9
Howard	27,028	6,151	22.8	27,203	4,897	18.0	1,254	20.4
Kent	1,542	204	13.2	1,553	156	10.0	48	23.5
Montgomery	97,486	24,880	25.5	98,107	20,695	21.1	4,185	16.8
Prince George's	88,767	21,958	24.7	89,328	19,104	21.4	2,854	13.0
Queen Anne's	4,235	1,001	23.6	4,264	929	21.8	72	7.2
Saint Mary's	11,611	2,063	17.8	11,685	1,737	14.9	326	15.8
Somerset	1,943	439	22.6	1,954	283	14.5	156	35.5
Talbot	2,902	680	23.4	2,921	591	20.2	89	13.1

	CY 2019			CY 2020			Drop in 2020	
County	Population of Children	Children Tested Number	Children Tested Percent	Population of Children	Children Tested Number	Children Tested Percent	Number	Percent
Washington	13,880	2,784	20.1	13,964	2,383	17.1	401	14.4
Wicomico	9,380	2,112	22.5	9,438	1,615	17.1	497	23.5
Worcester	3,547	815	23.0	3,569	658	18.4	157	19.3
Statewide	557,285	132,224	23.7	560,837	110,158	19.6	22,066	16.7

Table Four shows blood lead testing by jurisdiction. Figure One shows the number of children tested and reported to have blood lead levels ≥10 µg/dL. Figure Two shows the percent of children tested for lead with blood lead levels of 5-9 µg/dL over the years. Appendix A provides a breakdown of the number and percentage of children tested with blood lead levels ≥5, 5-9, and ≥10 µg/dL among children 1 and 2 years old by jurisdiction.

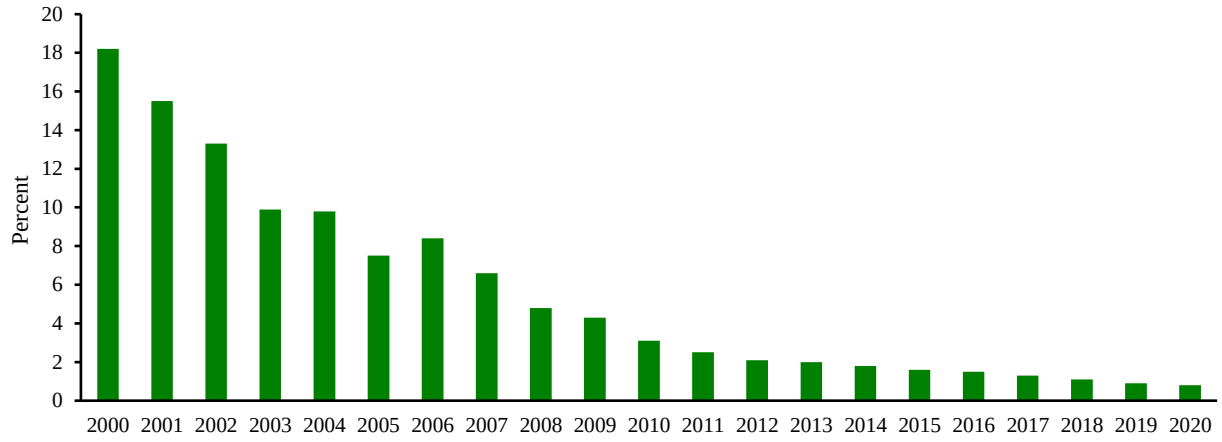
In 2020, 1.1% of children 0-72 months who were tested had a blood lead level of ≥5 µg/dL. This reflects a decrease from the rate of 1.2% in 2019. Over time, as the Reduction of Lead Risk in Housing Act has been implemented, the prevalence of elevated blood lead levels has declined. This is further depicted in the significant decline in elevated blood lead levels since the inception of the surveillance program. In 1993, 23.9%of children tested had a blood lead level of ≥10 µg/dL, compared with just 0.2% in 2020.

Table Four: Blood Lead Testing of Children 0-72 Months by Jurisdiction in CY20 [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	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Allegany	5,343	976	18.3	20	2.0	29	3.0	13	1.3	22	2.3	7	0.7	7	0.7
Anne Arundel	53,069	11,546	21.8	43	0.4	48	0.4	35	0.3	40	0.3	8	0.1	8	0.1
Baltimore	73,922	15,074	20.4	101	0.7	132	0.9	74	0.5	101	0.7	27	0.2	31	0.2
Baltimore City	62,282	11,543	18.5	247	2.1	352	3.0	199	1.7	283	2.5	48	0.4	69	0.6
Calvert	7,889	1,092	13.8	1	0.1	1	0.1		0.0	0	0.0	1	0.1	1	0.1
Caroline	3,564	655	18.4	4	0.6	7	1.1	2	0.3	4	0.6	2	0.3	3	0.5
Carroll	14,381	2,564	17.8	32	1.2	36	1.4	27	1.1	29	1.1	5	0.2	7	0.3
Cecil	9,957	1,341	13.5	27	2.0	29	2.2	17	1.3	19	1.4	10	0.7	10	0.7
Charles	14,588	2,461	16.9	16	0.7	18	0.7	12	0.5	13	0.5	4	0.2	5	0.2
Dorchester	3,082	472	15.3	4	0.8	8	1.7	3	0.6	6	1.3	1	0.2	2	0.4
Frederick	23,093	4,761	20.6	30	0.6	36	0.8	21	0.4	27	0.6	9	0.2	9	0.2
Garrett	2,457	298	12.1	3	1.0	3	1.0	2	0.7	2	0.7	1	0.3	1	0.3
Harford	23,224	4,327	18.6	33	0.8	35	0.8	26	0.6	28	0.6	7	0.2	7	0.2
Howard	27,203	4,897	18.0	32	0.7	38	0.8	25	0.5	27	0.6	7	0.1	11	0.2
Kent	1,553	156	10.0	2	1.3	2	1.3	2	1.3	2	1.3		0.0	0	0.0
Montgomery	98,107	20,695	21.1	105	0.5	127	0.6	84	0.4	99	0.5	21	0.1	28	0.1
Prince George's	89,328	19,104	21.4	150	0.8	176	0.9	106	0.6	126	0.7	44	0.2	50	0.3
Queen Anne's	4,264	929	21.8	6	0.6	7	0.8	4	0.4	5	0.5	2	0.2	2	0.2
Saint Mary's	11,685	1,737	14.9	8	0.5	10	0.6	7	0.4	8	0.5	1	0.1	2	0.1
Somerset	1,954	283	14.5	3	1.1	3	1.1	3	1.1	3	1.1		0.0	0	0.0
Talbot	2,921	591	20.2	2	0.3	3	0.5	2	0.3	2	0.3		0.0	1	0.2
Washington	13,964	2,383	17.1	34	1.4	43	1.8	24	1.0	32	1.3	10	0.4	11	0.5
Wicomico	9,438	1,615	17.1	15	0.9	20	1.2	12	0.7	17	1.1	3	0.2	3	0.2
Worcester	3,569	658	18.4	5	0.8	8	1.2	3	0.5	6	0.9	2	0.3	2	0.3
Statewide	560,837	110,158	19.6	923	0.8	1,171	1.1	703	0.6	901	0.8	220	0.2	270	0.2

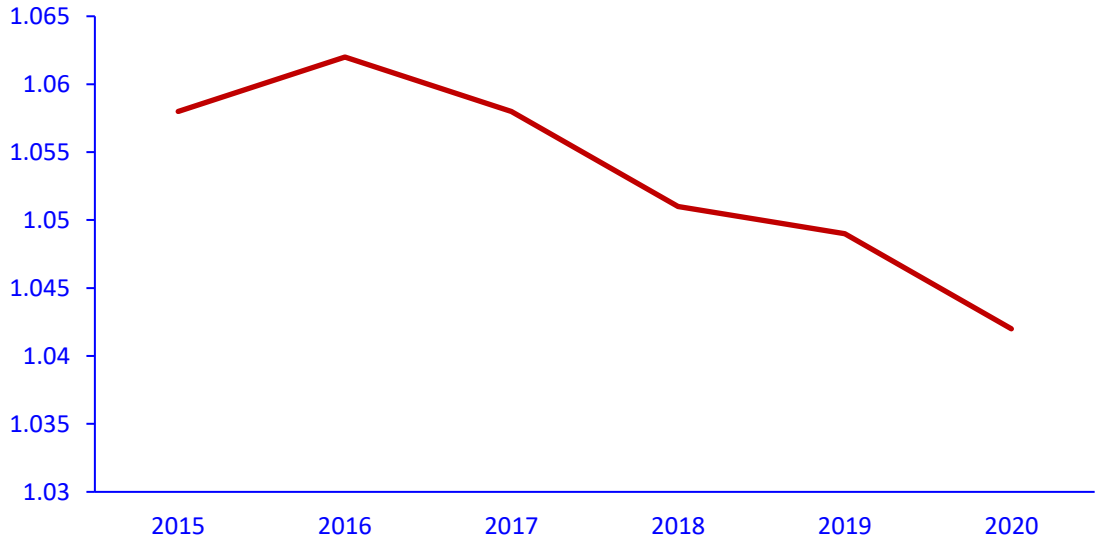
1. Table is based on the selection of the highest blood lead test for each child in calendar year 2020 in the order of venous, unknown, or capillary.
2. Adapted from Maryland census population 2010 provided by the Maryland Data Center, Maryland Department of Planning, planning.maryland.gov/msdc
3. Number of new cases with a given blood lead level in calendar year 2020. 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 calendar year 2020. These subjects 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 “environmental inspection/investigation

Figure Two: Percent of Children 0-72 Months Tested for Lead with the Highest Blood Lead Level 5-9 µg/dL: 2000-2020



Aside from the declining percentage of children diagnosed with elevated blood lead levels, another possible indicator that exposure among children is dropping is that the average number of blood lead tests per child has declined over time. The higher the child's blood lead level, the more follow up tests are needed to make sure the blood lead results are decreasing (Figure Three). After the initial increase from 2015 to 2016, mainly due to state endorsement of point of care testing and probably the eagerness of both providers and parents/guardians to do the test, the trend has been decreasing since then, indicating possibly that fewer follow-up tests are ordered because children, overall, have lower initial test results.

Figure Three: Average Number of Blood Lead Tests per Child Tested (2015-2020)



Admittedly, the decline in the average of blood lead tests per child in 2020 may be attributed to the overall drop in blood lead testing rather than the drop in childhood lead exposure.

Data Quality

In 2020, CLR received the reports of blood lead tests from 146 entities, of which 130 were clinics or establishments doing in-office blood lead testing (point of care). The average number of reports for the year per establishment was 828.4, with a variation from five to more than 47,000. Five establishments send the reports electronically (70,312), with the rest in hard copy.

CLR makes all efforts to make sure the reports of blood lead tests are complete and, to the extent that is possible, correct. Table Five displays a summary of the completeness of data in blood lead reports for CY20. Completeness of data does not necessarily mean accuracy of the data.

Table Five: Completeness of Data for CY20

Item	Percent Complete
Child's name*	100.0
Date of Birth*	99.8
Sex/Gender	98.8
Race	51.4
Ethnicity	48.6
Guardian's name	74.2
Sample type	99.8
Test date*	99.9
Blood lead level*	100.0
Address (geocoded)	87.0
Telephone number	96.3

* The record missing this information is held until the missing information is filled in.

Blood Lead Laboratory Reporting Requirement as of July 1, 2020

The amended law and regulations* of 2020 require that the following information be included in the lab report:

1. Child information:

Name (last name, first name, middle initial)
Date of birth
Gender
Race
Ethnicity
Address: complete street address with apartment number (if applicable), city/town, state, zip code, county
Country of birth
Pregnancy status at the time test (if applicable)
Parent/Guardian name (last name, first name)
Parent/Guardian Address (if different from the child address)
Telephone number
Medical assistance number if enrolled in Medicaid or the Maryland Children's Health Program

2: Test information

Date specimen was drawn
Type of specimen
Blood lead level (in microgram per deciliter "µg/dL" with up to two decimal points) with the applicable comparator.
The date the test was done (analyzed)
Method of measurement
The method of measurement detection limit
The date the result was reported/sent to the state

3: Provider/Submitter information:

Name (last name, first name)
National provider identifier (NPI)
Office address
Office telephone number
Office fax number
Contact person (if applicable)

4: Laboratory information:

Name of the establishment
Clinical laboratory improvement amendment (CLIA) number
Address
Telephone number
Fax number
Contact person (name, telephone number

** Any blood lead test with a blood lead level ≥5.00 µg/dL should be reported to the state within 24 hours after the test if finalized. All other results can be reported up to two (2) weeks after the test is finalized.

Medical and Environmental Case Management Maryland Counties (Excluding Baltimore City)

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 Maryland's Case Management Guidelines (Guidelines). During the first six months of CY20, environmental case management was required 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 (confirmed cases). On July 1, 2020, new regulations became effective that required case management of children aged 0-72 months when they are identified with a blood lead level at the new reference level of ≥5 µg/dL.

In CY20, there were 301 children aged 0-72 months identified with confirmed blood lead levels of ≥5 µg/d in Maryland counties, excluding Baltimore City. Of 301 children, 131 were identified with a confirmed blood lead level of ≥10 µg/dL in CY20. This is the same number of children identified with blood lead levels of ≥10 µg/dL in CY19. In CY20, there were 170 children identified with blood lead levels of 5-9 µg/dL between July 1-Dec. 31, 2020.

During CY20, of the 301 total cases, medical case management was completed by local health departments on 198 (65.8%) of the new cases. During CY20 medical case management was completed by local health departments on 105 (80.1%) of 131 cases of children with blood lead levels of ≥10 µg/dL. The completion rate for medical case management for the 170 children with blood lead levels of 5-9 µg/dL was significantly lower at 93 (54.7%). Table Six illustrates the medical case management outcomes for the 301 new cases of children identified with blood lead levels of ≥5 µg/dL in Maryland counties, excluding Baltimore City, for CY20. Medical case management guidelines in Maryland consider telephonic and in person home visits as acceptable forms of medical case management for lead exposures.

Table Six: Medical Case Management Outcomes ≥5 µg/dL CY 20 Maryland Counties (Excluding Baltimore City)

Total Referrals	Completed Medical Outreach and Education (In-home or telephonic)	Unable to contact family/family moved	Refused
301	198	82	21

An Environmental Investigation is a comprehensive assessment that requires direct contact with families and their property. In CY20, Environmental Investigations were completed on 154 (50.6%) of properties for new cases of blood lead levels of ≥5 µg/dL This was a significant decline from CY19, where Environmental Investigations were completed in 85% of properties. This decline can in part be attributed to the COVID-19 pandemic. Specifically, more families were unwilling to allow Environmental Investigations in their homes during CY20. In CY20, 74 (24.3%) of all Environmental Investigations were refused. To address the decrease in environmental investigations, upon scheduling the home visit, MDE inspection staff communicated COVID safety protocols regarding the wearing of personal protective equipment while investigating to ease potential exposure concerns of the parents and guardians of persons at risk to increase completion rates. Further, MDE continued to administer the environmental questionnaire to collect information on the possible home hazards within the home to discuss potential strategies to decrease exposure within the residence until an inspection occurred. Table Seven illustrates the Environmental Investigation outcomes for new cases in the counties for CY20.

Table Seven: Environmental Investigation Outcomes ≥5 µg/dL CY20 Maryland Counties (Excluding Baltimore City)

Total Referrals	Completed	Unable to contact family/family moved	Refused
304*	154	76	74

* Three additional Environmental Investigations were performed on secondary addresses

Medical and Environmental Case Management Baltimore City

The Baltimore City Health Department performs all case management for children aged 0-72 months identified with blood lead levels of ≥5 µg/dL in Baltimore City. During CY20, there were 44 new cases of children aged 0-72 months identified with blood lead levels of ≥10 µg/dL in Baltimore City. This is a decrease of 53.7% when compared to CY19 in which there were 82 new cases of children identified with blood lead levels of ≥10 µg/dL. On July 1, 2020, case management began on children with blood lead levels of ≥5 µg/dL. During the second half of CY20, there were 86 new cases of children identified with blood lead levels of 5-9 µg/dL. The total number of new cases for children aged 0-72 months identified with a blood lead level ≥5 µg/dL in Baltimore City for CY20 was 130.

Medical case management was completed on 29 (66.0%) of the 44 new cases of children identified with a blood lead level of ≥10 µg/dL. The completion rate for medical case management for the 86 children with blood lead levels of 5-9 µg/dL was significantly lower at 21 (24.4%).

Table Eight illustrates the medical case management outcomes for new cases in Baltimore City for CY20 for blood lead levels ≥5 µg/dL. Of the 130 new cases, medical case management was completed on 50 (38.5%).

Table Eight: Medical Case Management Outcomes ≥5 µg/dL CY20 Baltimore City

Total Referrals	Completed Medical Outreach and Education (In-home or telephonic)	No Response /family moved/Refused	Delayed due to COVID-19 Restrictions
130	50	36	44

In CY20, Baltimore City Health Department's ability to conduct full, in-home Environmental Investigations was impacted by the COVID-19 pandemic. From March 2020 through October 2021, the Baltimore City government had restrictions in place on the performance of certain in-person functions, including most Environmental Investigations. During this period, Baltimore City performed partial Environmental Investigations via telephone or virtual (video) means wherever possible. Since in-person Environmental Investigations were resumed in October 2021, Baltimore City has begun offering to complete the in-home portion of Environmental Investigations that had been performed partially during the pandemic.

Environmental Investigations were completed on 10 (8%) of properties with new cases of blood lead levels of ≥5 µg/dL in Baltimore City, and partial Environmental Investigations were completed on 26 (20.8%) of properties with new cases of blood lead levels of ≥5 µg/dL. This was a significant decline from CY19, where Environmental Investigations were completed on 71% of all properties in Baltimore City. Table Nine illustrates the Environmental Investigation outcomes for new cases in Baltimore City in CY20.

Table Nine: Environmental Investigation Outcomes ≥5 µg/dL CY20 Baltimore City

Total Referrals	Completed	Partially completed	Unable to locate family/family moved/Refused	Delayed due to COVID-19 Restrictions
125*	10	26	88	1

*Siblings at the same address account for decrease in inspections when compared with Medical visits.

Property Type: Environmental Investigations Statewide CY20

Table Ten lists the property type for each completed Environmental Investigation by jurisdiction. In CY20, 87 (56.5%) of the Environmental Investigations completed in Maryland counties, excluding Baltimore City, were identified as rental properties. In CY20, 67 (43.5%) of the Environmental Investigations completed in Maryland counties were identified as owner-occupied properties. In CY20, 18 (50%) of the Environmental Investigations completed in Baltimore City were identified as rental properties. In CY20, 18 (50%) of the Environmental Investigation completed in Baltimore City were identified as owner-occupied properties. Note that these statistics include partial Environmental Investigations performed by Baltimore City, as described above.

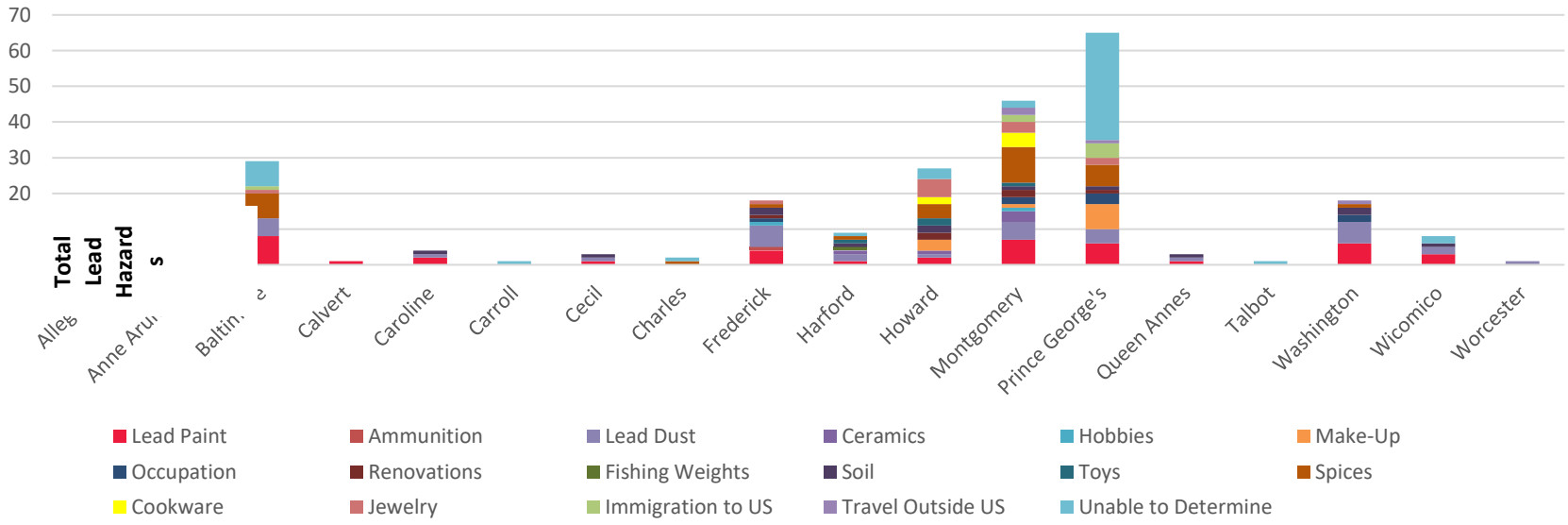
Table Ten: Environmental Investigation Property Type by County CY20 Blood Lead Levels ≥5 µg/dL

	Total Environmental Investigations	Owner-Occupied Pre-50		1950-1977		Post-1977		Rental Property Pre-1950		1950-1977		Post-1977	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Allegany	7	4	57.2	0	0.0	0	0.0	3	42.8	0	0.0	0	0.0
Anne Arundel	7	3	42.8	1	14.3	1	14.3	0	0.0	0	0.0	2	28.6
Baltimore	25	7	28.0	4	16.0	2	8.0	2	8.0	7	28.0	3	12.0
Calvert	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
Caroline	2	1	50.0	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0
Carroll	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Cecil	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Charles	2	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0	1	50.0
Dorchester	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Frederick	7	3	42,8	0	0.0	2	28.6	2	28.6	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	4	1	25.0	0	0.0	2	50.0	0	0.0	0	0.0	1	25.0
Howard	12	1	8.3	0	0.0	6	50.0	0	0.0	2	16.7	3	25.0
Kent	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Montgomery	19	3	15.8	1	5.3	3	15.8	2	10.5	6	31.6	4	21.0
Prince George's	50	4	8.0	6	12.0	4	8.0	3	6.0	31	62.0	2	4.0
Queen Anne's	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Saint Mary's	0	0	0.0	0	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
Talbot	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
Washington	8	1	12.5	0	0.0	0	0.0	6	75.0	0	0.0	1	12.5
Wicomico	5	2	40.0	0	0.0	0	0.0	2	40.0	0	0.0	1	20,0
Worcester	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
County Total	**154**	**33**	**21.4**	**12**	**7.8**	**22**	**14.3**	**23**	**14.9**	**46**	**29.9**	**18**	**11.7**
Baltimore City Total	**36**	**15**	**41.7**	**3**	**8.3**	**0**	**0.0**	**17**	**47.2**	**1**	**2.9**	**0**	**0.0**

Sources of Lead

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 5 illustrates the distribution of lead hazards that were identified during Environmental Investigations.

Figure Five: Distribution of Lead Sources by County CY 20 (Excluding Baltimore City)



Lead Hazards Identified by Housing Type

Figure Six illustrates the percentages of lead hazards in owner occupied housing, by built date, identified during Environmental Investigations in CY20 in Maryland Counties, excluding Baltimore City. Figure Seven illustrates the percentages of lead hazards in rental housing, by built date, identified during Environmental Investigations in CY20 in Maryland counties.

Figure Six: Lead Hazards Identified in Owner Occupied Housing Maryland Counties CY 20

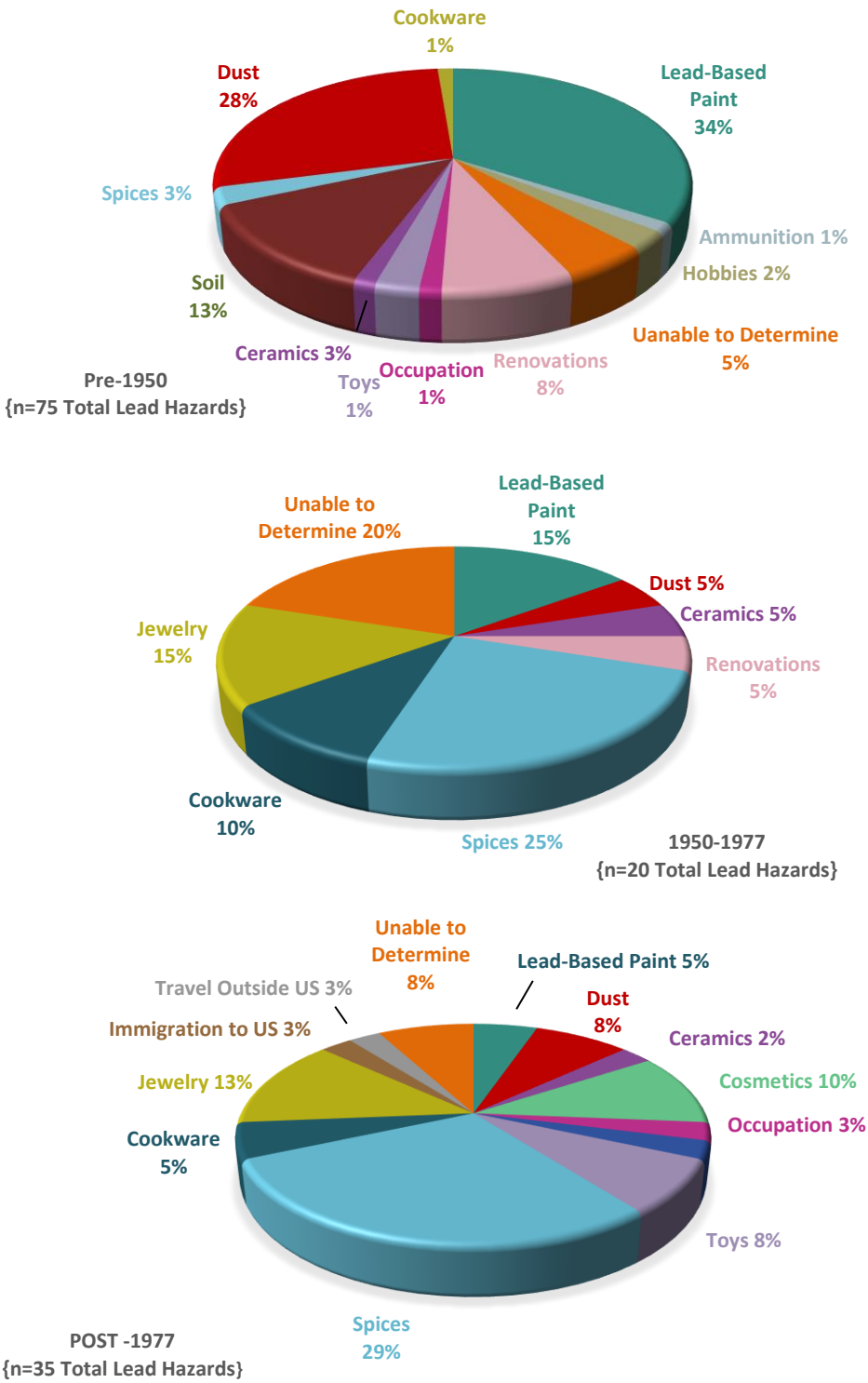
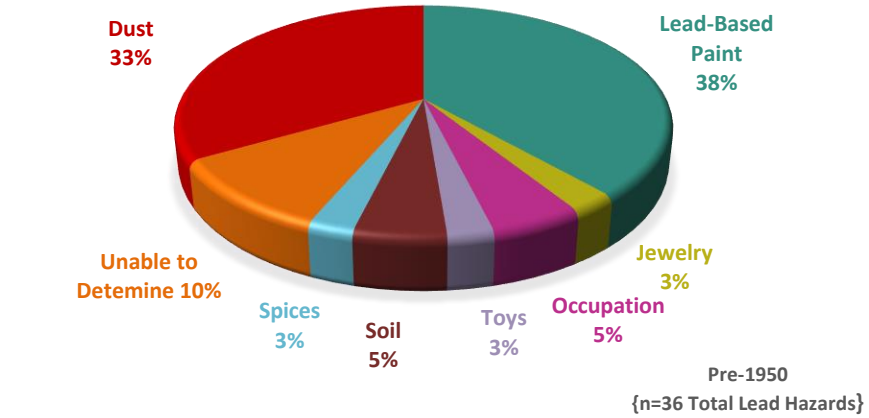
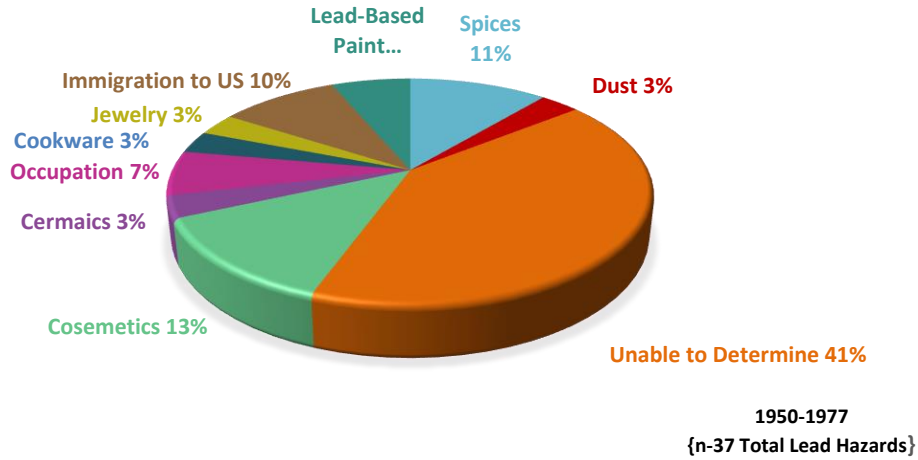


Figure 7: Lead Hazards Identified in Rental Housing Maryland Counties CY20





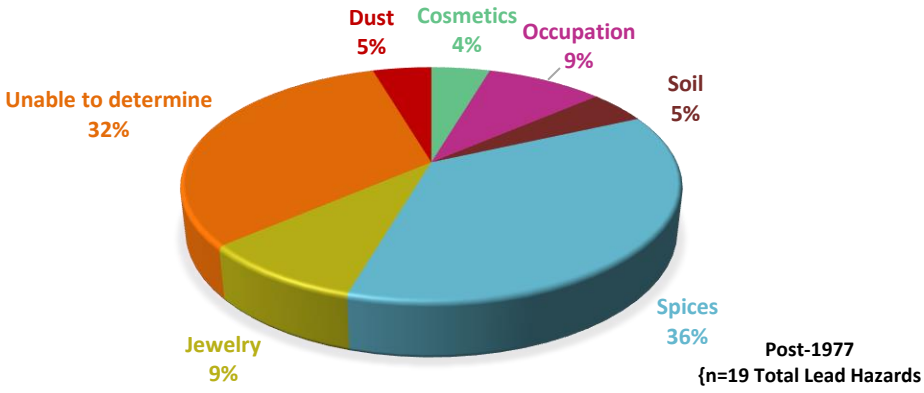


Figure Eight illustrates the percentages of lead hazards in owner occupied housing, by built date, identified during Environmental Investigations in CY20 in Baltimore City. Figure Nine illustrates the percentages of lead hazards in rental housing, by built date, identified during Environmental Investigations in CY20 in Baltimore City. Note that these statistics include partial Environmental Investigations performed by Baltimore City, as described above.

Figure Eight: Lead Hazards Identified in Owner Occupied Housing Baltimore City CY20

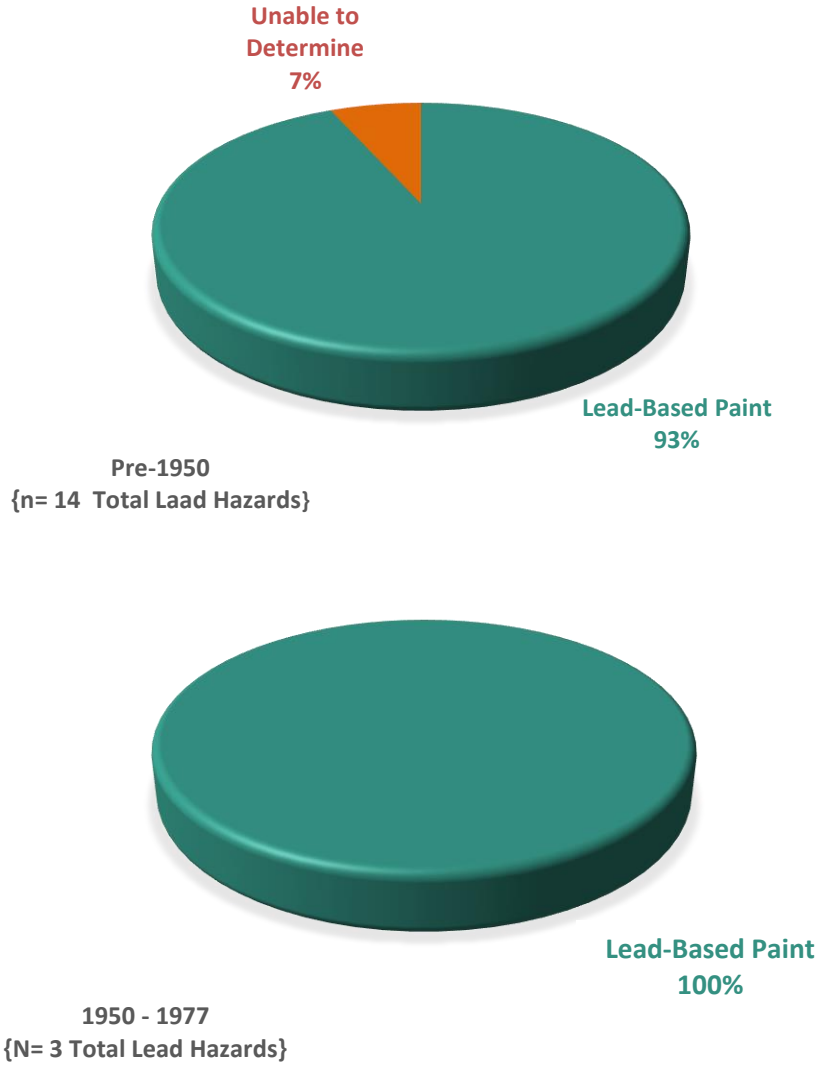


Figure Nine: Lead Hazards Identified in Rental Housing Baltimore City CY20

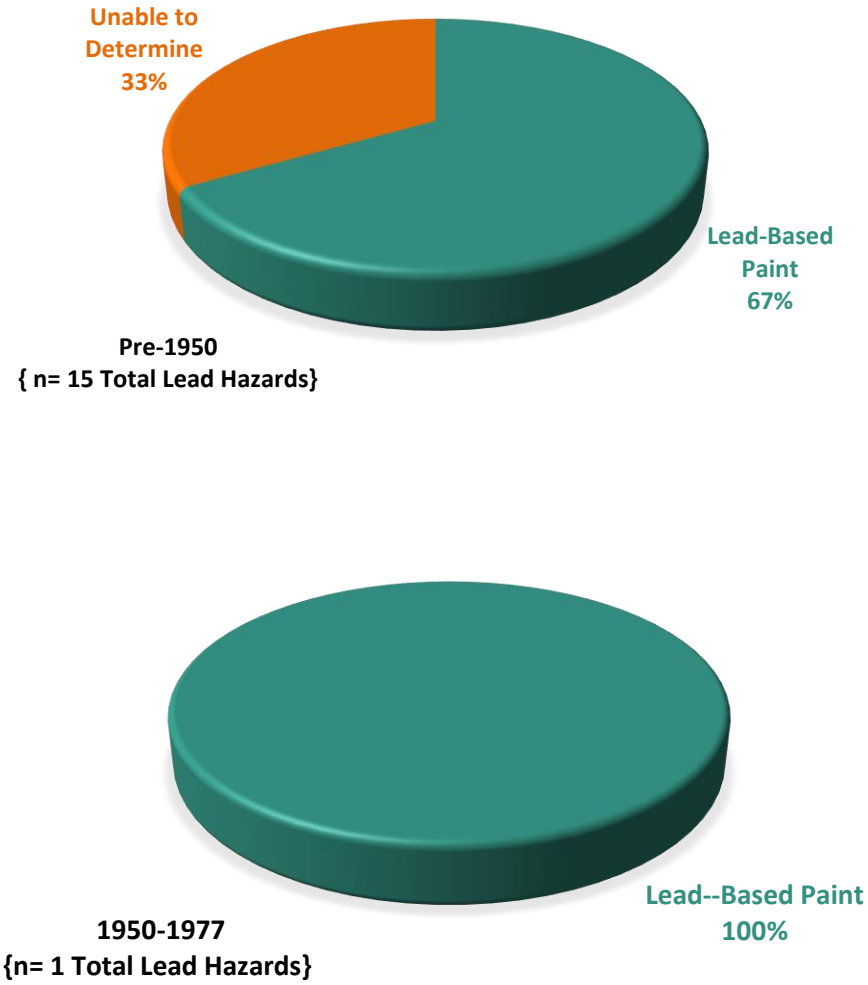
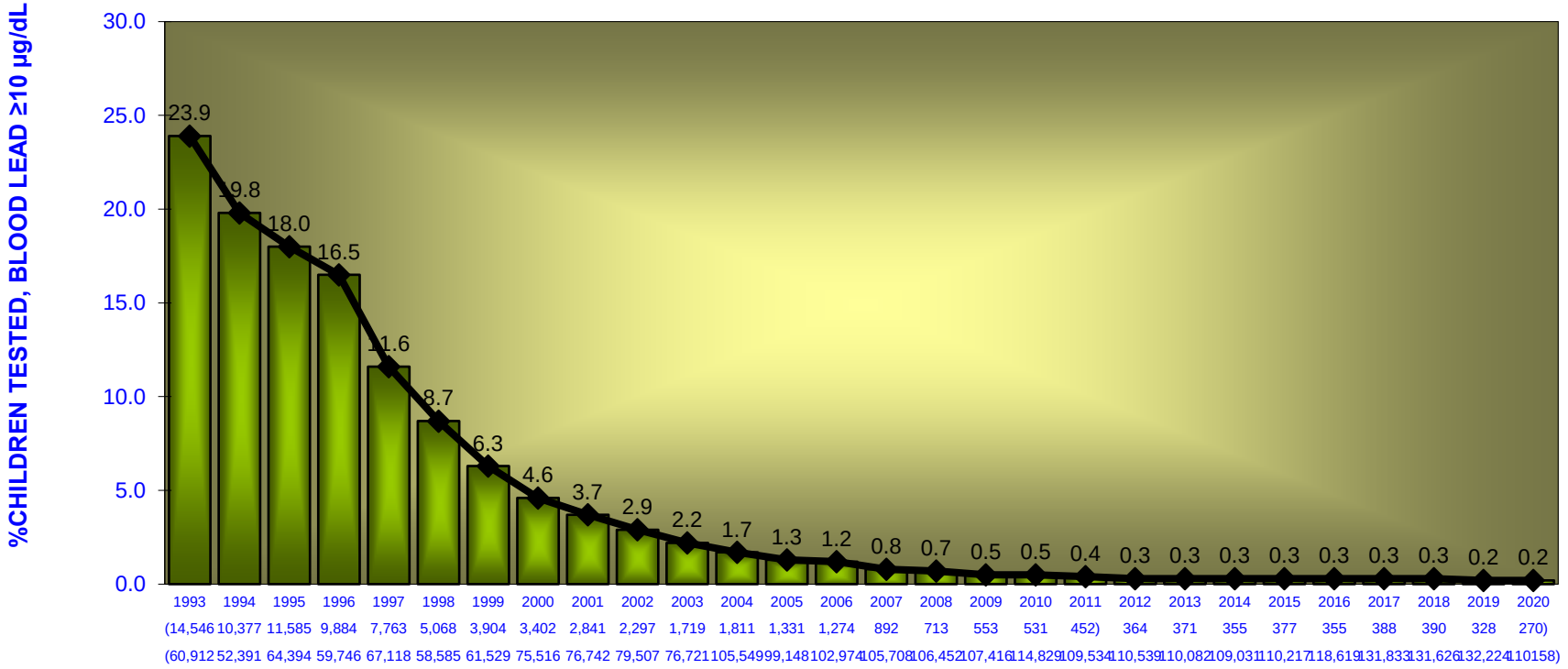


Table Eleven shows the distribution of lead hazards by county from CY16–20 for all counties in Maryland.

Table Eleven: Lead Hazards by County Cumulative CY 16 – CY 20

County	Total Environmental Investigations	Lead Paint	Lead Dust	Water Soil	Cosmetics	Spices	Personal Items (Jewelry)	Hobbies (Ammunition, stained glass)	Recent Travel Outside US or Recent Arrival to US	Pottery or Cookware	Renovation	Occupation	Consumer Products (Toys, other)	Unable to Determine
Allegany	26	13	15	4	0	0	0	0	0	0	2	0	0	0
Anne Arundel	35	7	5	0	4	14	1	4	6	0	0	2	1	0
Baltimore	127	31	15	2	2	35	13	6	22	0	0	0	1	19
Calvert	3	2	1	0	0	0	0	2	1	0	0	0	0	0
Caroline	9	3	2	3	0	0	0	1	0	0	0	0	0	3
Carroll	12	8	6	1	0	0	1	0	1	0	0	0	0	3
Cecil	5	1	1	1	0	0	2	1	0	0	0	0	0	0
Charles	10	1	1	0	0	4	0	2	0	0	0	0	0	2
Dorchester	10	9	7	0	0	0	0	0	0	0	0	0	0	1
Frederick	25	11	12	3	2	4	5	3	3	0	1	1	0	1
Garret	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Harford	11	5	4	1	0	21	0	1	1	1	0	0	1	0
Howard	44	4	1	1	14	24	11	0	12	3	1	0	2	5
Kent	2	0	0	0	1	0	0	0	0	0	0	0	0	1
Montgomery	96	10	15	4	13	41	8	3	31	12	2	2	1	13
Prince George's	221	17	12	3	19	11	7	3	89	0	1	4	81	51
Queen Anne's	2	2	1	1	0	0	0	0	0	0	0	0	0	0
Saint Mary's	2	0	1	0	1	1	0	0	0	0	0	1	0	0
Somerset	4	3	0	0	0	0	0	0	1	0	0	0	0	0
Talbot	9	3	1	1	0	0	0	2	1	0	0	0	0	3
Washington	37	19	14	32	1	2	2	0	2	0	0	2	0	4
Wicomico	23	16	8	3	0	0	0	3	0	0	0	0	0	3
Worcester	6	3	2	0	0	0	1	1	0	0	0	0	0	1
Totals Counties	**720**	**168**	**124**	**60**	**57**	**157**	**51**	**33**	**170**	**16**	**7**	**12**	**87**	**110**
Baltimore City	**282**	**218**	**7**	**2**	**0**	**0**	**9**	**2**	**3**	**3**	**0**	**0**	**0**	**36**

MARYLAND DEPARTMENT OF THE ENVIRONMENT
CHILDHOOD BLOOD LEAD SURVEILLANCE
STATEWIDE 1993-2020



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

Appendix A: Blood Lead Testing of Children 1- and 2-Years Old by Jurisdiction in CY20

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	854	469	54.9	8	1.7	8	1.7	5	1.1	5	1.1	3	0.6	3	0.6
Two Years	895	431	48.2	8	1.9	10	2.3	7	1.6	9	2.1	1	0.2	1	0.2
Total	1,749	900	51.5	16	1.8	18	2.0	12	1.3	14	1.6	4	0.4	4	0.4
Anne Arundel															
One Year	8,942	5,164	57.7	21	0.4	22	0.4	17	0.3	18	0.3	4	0.1	4	0.1
Two Years	8,872	4,331	48.8	16	0.4	16	0.4	13	0.3	13	0.3	3	0.1	3	0.1
Total	17,814	9,495	53.3	37	0.4	38	0.4	30	0.3	31	0.3	7	0.1	7	0.1
Baltimore															
One Year	12,546	6,349	50.6	49	0.8	52	0.8	38	0.6	41	0.6	11	0.2	11	0.2
Two Years	12,240	5,549	45.3	34	0.6	45	0.8	22	0.4	31	0.6	12	0.2	14	0.3
Total	24,786	11,898	48.0	83	0.7	97	0.8	60	0.5	72	0.6	23	0.2	25	0.2
Baltimore City															
One Year	11,005	4,990	45.3	131	2.6	137	2.7	107	2.1	112	2.2	24	0.5	25	0.5
Two Years	10,601	3,821	36.0	72	1.9	112	2.9	57	1.5	89	2.3	15	0.4	23	0.6
Total	21,606	8,811	40.8	203	2.3	249	2.8	164	1.9	201	2.3	39	0.4	48	0.5
Calvert															
One Year	1,228	469	38.2	1	0.2	1	0.2	0	0.0	0	0.0	1	0.2	1	0.2
Two Years	1,261	324	25.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	2,489	793	31.9	1	0.1	1	0.1	0	0.0	0	0.0	1	0.1	1	0.1
Caroline															
One Year	578	318	55.0	1	0.3	2	0.6	0	0.0	1	0.3	1	0.3	1	0.3
Two Years	585	268	45.8	2	0.7	3	1.1	2	0.7	2	0.7	0	0.0	1	0.4
Total	1,163	586	50.4	3	0.5	5	0.9	2	0.3	3	0.5	1	0.2	2	0.3

Blood Lead Testing of Children 1- and 2-Years Old by Jurisdiction in CY20

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	2,219	1,156	52.1	8	0.7	9	0.8	5	0.4	5	0.4	3	0.3	4	0.3
Two Years	2,309	1,095	47.4	19	1.7	19	1.7	17	1.6	17	1.6	2	0.2	2	0.2
Total	4,528	2,251	49.7	27	1.2	28	1.2	22	1.0	22	1.0	5	0.2	6	0.3
Cecil															
One Year	1,691	596	35.2	10	1.7	10	1.7	5	0.8	5	0.8	5	0.8	5	0.8
Two Years	1,650	370	22.4	5	1.4	6	1.6	3	0.8	4	1.1	2	0.5	2	0.5
Total	3,341	966	28.9	15	1.6	16	1.7	8	0.8	9	0.9	7	0.7	7	0.7
Charles															
One Year	2,334	1,193	51.1	6	0.5	6	0.5	5	0.4	5	0.4	1	0.1	1	0.1
Two Years	2,529	791	31.3	9	1.1	9	1.1	6	0.8	6	0.8	3	0.4	3	0.4
Total	4,863	1,984	40.8	15	0.8	15	0.8	11	0.6	11	0.6	4	0.2	4	0.2
Dorchester															
One Year	520	231	44.4	2	0.9	2	0.9	1	0.4	1	0.4	1	0.4	1	0.4
Two Years	528	189	35.8	2	1.1	3	1.6	2	1.1	3	1.6	0	0.0	0	0.0
Total	1,048	420	40.1	4	1.0	5	1.2	3	0.7	4	1.0	1	0.2	1	0.2
Frederick															
One Year	3,643	2,184	60.0	13	0.6	16	0.7	12	0.5	15	0.7	1	0.0	1	0.0
Two Years	3,870	1,868	48.3	11	0.6	13	0.7	6	0.3	8	0.4	5	0.3	5	0.3
Total	7,513	4,052	53.9	24	0.6	29	0.7	18	0.4	23	0.6	6	0.1	6	0.1
Garrett															
One Year	364	121	33.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Two Years	411	125	30.4	2	1.6	2	1.6	1	0.8	1	0.8	1	0.8	1	0.8
Total	775	246	31.7	2	0.8	2	0.8	1	0.4	1	0.4	1	0.4	1	0.4

Blood Lead Testing of Children 1- and 2-Years Old by Jurisdiction in CY19

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	3,783	1,541	40.7	14	0.9	15	1.0	9	0.6	10	0.6	5	0.3	5	0.3
Two Years	3,814	1,635	42.9	12	0.7	12	0.7	10	0.6	10	0.6	2	0.1	2	0.1
Total	7,597	3,176	41.8	26	0.8	27	0.9	19	0.6	20	0.6	7	0.2	7	0.2
Howard															
One Year	4,283	1,901	44.4	12	0.6	12	0.6	10	0.5	10	0.5	2	0.1	2	0.1
Two Years	4,542	1,779	39.2	9	0.5	10	0.6	6	0.3	7	0.4	3	0.2	3	0.2
Total	8,825	3,680	41.7	21	0.6	22	0.6	16	0.4	17	0.5	5	0.1	5	0.1
Kent															
One Year	263	79	30.0	1	1.3	1	1.3	1	1.3	1	1.3	0	0.0	0	0.0
Two Years	244	52	21.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	507	131	25.8	1	0.8	1	0.8	1	0.8	1	0.8	0	0.0	0	0.0
Montgomery															
One Year	16,343	7,064	43.2	41	0.6	47	0.7	36	0.5	41	0.6	5	0.1	6	0.1
Two Years	16,445	7,404	45.0	35	0.5	41	0.6	26	0.4	30	0.4	9	0.1	11	0.1
Total	32,788	14,468	44.1	76	0.5	88	0.6	62	0.4	71	0.5	14	0.1	17	0.1
Prince George’s															
One Year	15,196	6,439	42.4	46	0.7	52	0.8	30	0.5	34	0.5	16	0.2	18	0.3
Two Years	14,941	5,651	37.8	45	0.8	55	1.0	34	0.6	43	0.8	11	0.2	12	0.2
Total	30,137	12,090	40.1	91	0.8	107	0.9	64	0.5	77	0.6	27	0.2	30	0.2
Queen Anne's															
One Year	674	380	56.4	4	1.1	5	1.3	2	0.5	3	0.8	2	0.5	2	0.5
Two Years	680	385	56.6	2	0.5	2	0.5	2	0.5	2	0.5	0	0.0	0	0.0
Total	1,354	765	56.5	6	0.8	7	0.9	4	0.5	5	0.7	2	0.3	2	0.3

Blood Lead Testing of Children 1- and 2-Years Old by Jurisdiction in CY19

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	1,904	844	44.3	5	0.6	6	0.7	5	0.6	6	0.7	0	0.0	0	0.0
Two Years	1,907	541	28.4	2	0.4	2	0.4	1	0.2	1	0.2	1	0.2	1	0.2
Total	3,811	1,385	36.3	7	0.5	8	0.6	6	0.4	7	0.5	1	0.1	1	0.1
Somerset															
One Year	331	123	37.2	3	2.4	3	2.4	3	2.4	3	2.4	0	0.0	0	0.0
Two Years	350	130	37.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	681	253	37.2	3	1.2	3	1.2	3	1.2	3	1.2	0	0.0	0	0.0
Talbot															
One Year	512	271	52.9	1	0.4	1	0.4	1	0.4	1	0.4	0	0.0	0	0.0
Two Years	510	252	49.4	1	0.4	2	0.8	1	0.4	1	0.4	0	0.0	1	0.4
Total	1,022	523	51.2	2	0.4	3	0.6	2	0.4	2	0.4	0	0.0	1	0.2
Washington															
One Year	2,251	1,038	46.1	17	1.6	18	1.7	14	1.3	15	1.4	3	0.3	3	0.3
Two Years	2,357	829	35.2	11	1.3	13	1.6	6	0.7	8	1.0	5	0.6	5	0.6
Total	4,608	1,867	40.5	28	1.5	31	1.7	20	1.1	23	1.2	8	0.4	8	0.4
Wicomico															
One Year	1,618	766	47.3	9	1.2	10	1.3	7	0.9	8	1.0	2	0.3	2	0.3
Two Years	1,573	616	39.2	3	0.5	5	0.8	3	0.5	5	0.8	0	0.0	0	0.0
Total	3,191	1,382	43.3	12	0.9	15	1.1	10	0.7	13	0.9	2	0.1	2	0.1
Worcester															
One Year	602	275	45.7	1	0.4	1	0.4	1	0.4	1	0.4	0	0.0	0	0.0
Two Years	593	322	54.3	4	1.2	6	1.9	2	0.6	4	1.2	2	0.6	2	0.6
Total	1,195	597	50.0	5	0.8	7	1.2	3	0.5	5	0.8	2	0.3	2	0.3

Blood Lead Testing of Children 1- and 2-Years Old by Jurisdiction in CY19

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	93,684	43,962	46.9	404	0.9	436	1.0	314	0.7	341	0.8	90	0.2	95	0.2
Two Years	93,707	38,757	41.4	304	0.8	386	1.0	227	0.6	294	0.8	77	0.2	92	0.2
Total	187,391	82,719	44.1	708	0.9	822	1.0	541	0.7	635	0.8	167	0.2	187	0.2