

Environmental Health Bureau

Childhood Blood Lead Testing in Maryland: Evaluation and Recommendations

DECEMBER 2022



EXECUTIVE SUMMARY

This report reviews Maryland's recent experience in universal childhood blood lead testing and presents recommendations for future childhood blood lead testing policies. It evaluates the impacts of policy decisions in 2015 and 2016 aimed at improving lead testing rates statewide, the impacts of the COVID-19 pandemic on lead testing rates, and national changes in the blood lead reference value (BLRV) in 2021. The principal findings of the review are:

Finding 1: Regulatory changes in 2015 and 2016, including the changes to the state's testing strategy, had a clear positive impact on blood lead testing rates, particularly in areas not previously defined as at risk for lead poisoning.

Finding 2: While the increase in blood lead testing rates identified more children with blood lead levels between 5 and 9 µg/dL, there was not a corresponding increase in the number of children with blood lead levels of 10 µg/dL or greater, which was the legal definition of elevated blood lead level at the time in Maryland.

Finding 3: Despite improvements, lead testing rates continue to fall below goals, and new tools are needed to promote and facilitate testing for both families and providers.

Based on these findings, the report offers the following recommendations:

Recommendation 1: Maryland should continue the current strategy of defining the entire state as at risk and continue to test all children at 12 and 24 months of age. MDH and MDE should analyze the distribution of blood lead levels from January, 2023 forward in re-evaluating the state's testing strategy. At least three years of data will be required to assess the strategy and impacts of other changes underway in lead poisoning prevention in the state.

Recommendation 2: MDH and MDE should work with the provider community to increase testing rates, and improve provider reporting of blood lead test results and data on race and ethnicity.

Recommendation 3: The new BLRV of 3.5 µg/dL will result in an increase in the number of children who require some clinical and/or case management follow up, and state agencies should carefully evaluate the messaging, effort, resources, and health equity implications of these changes.

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1. BACKGROUND AND INTRODUCTION

Maryland remains committed to the elimination of lead exposure and childhood lead poisoning in the state. Maryland Department of Health (“MDH”, formerly the Maryland Department of Health and Mental Hygiene, or “DHMH”) regulations on childhood lead testing require that health care providers conduct blood lead tests on children under the age of 6 years residing in areas at risk for lead exposure at 12 and 24 months of age (Code of Maryland Regulations 10.11.04). Because most cases of childhood lead poisoning stemmed from lead paint exposure in older residences, the state’s targeting plans for blood lead testing in 2000 and 2004 identified areas at risk based on housing age and demographic status.

In addition, all children enrolled in the Medicaid Early and Periodic Screening, Diagnostic and Treatment (EPSDT) program are required to be tested for blood lead at 12 and 24 months.

The October, 2015 [Maryland Targeting Plan for Areas at Risk for Childhood Lead Poisoning](#) (“2015 Targeting Plan”) designated all areas of the state as at risk for childhood lead poisoning. The 2015 Targeting Plan made three key recommendations:

1. ***Testing of all Maryland children ages 12 and 24 months:*** For a period of three years, all Maryland children under the age of 6 years should be tested for lead exposure at 12 and 24 months of age, based on a determination by MDH that all ZIP codes and census tracts in the state should be considered at risk under the requirements of Maryland Code Annotated, Health-General Article, § 18-106, and Code of Maryland Regulations (COMAR) 10.11.04.¹
2. ***Re-evaluation of recommendations based on surveillance findings:*** At the end of three years, MDH will re-evaluate these recommendations, based on the analysis of blood lead testing data developed over the three-year period.
3. ***Clinical management:*** Like children with higher blood lead levels, children with blood lead levels of 5 – 9 micrograms per deciliter (µg/dL) should have a confirmatory test, an assessment of possible sources of lead exposure, an assessment of other vulnerable individuals in the home, and a repeat blood test until it is clear that they do not have ongoing lead exposure.²

Based on these recommendations, MDH revised its regulations for childhood lead testing on March 28, 2016 to require health care providers to test children for lead as follows:

- Health care providers were required to do blood lead tests for all children born on or after January 1, 2015 at age 12 and 24 months regardless of their place of residence, as the 2015 Targeting Plan designated all ZIP codes in the state as at risk.

¹ The 2015 Targeting Plan refers to DHMH, or the Department of Health and Mental Hygiene. The Department’s name was since changed to the Maryland Department of Health (MDH), which is used in this report for consistency and clarity.

² When the 2015 Targeting Plan was released, the legal definition of an elevated blood lead level in Maryland was still 10 µg/dL (Maryland Code Annotated, Environment Article, §6-304).

- For children born before January 1, 2015, the blood lead testing requirements for children not enrolled in Medicaid continued to be based on whether they lived in at risk areas as defined in the 2004 Targeting Plan for Areas at Risk for Childhood Lead Poisoning.
- The requirement for all children enrolled in Maryland's Medicaid's Early Prevention, Screening, Diagnosis and Treatment (EPSDT) program to be tested at 12 and 24 months of age, regardless of their place of residence, was not affected by the new regulations.

MDH conducted outreach to health care providers to inform them of the new requirements. Outreach included distribution to all Maryland health care providers of a laminated copy of the 2016 Maryland Guidelines for the Assessment and Management of Childhood Lead Exposure,¹ developed by MDH and the Maryland Department of the Environment (MDE) Lead Poisoning Prevention Program; additional notifications to child care providers and schools (Maryland requires a certification of blood testing for children entering child care, pre-kindergarten, kindergarten, or first grade); and a variety of online materials and video presentations for parents² and health care providers.³

In 2019, the Maryland General Assembly enacted HB 1233, which changed the blood lead reference level (used for triggering case management, notification, and property owner responsibilities) from 10 µg/dL to the blood lead reference level established by the Centers for Disease Control and Prevention (CDC), which at the time of enactment was 5 µg/dL.

In late 2019, the MDH Environmental Health Bureau (EHB) began an evaluation of the impacts of the regulatory changes, as recommended in the 2015 Targeting Plan. The goals of the evaluation were:

1. Measure the impacts of the Department's changes to COMAR 10.11.04 on childhood blood lead testing rates;
2. Determine whether the regulatory changes had any impact on the number and rates of children with elevated blood lead levels; and
3. Based on findings, make recommendations related to future testing policies.

Two factors significantly affected and delayed this evaluation:

- First and foremost was the onset in Maryland in March, 2020 of the worldwide pandemic of COVID-19. The pandemic was associated with large decreases in routine medical utilization and well-child indicators, including vaccinations and routine testing. Based on prior years of testing, the MDE Lead Poisoning Prevention Program estimated the number of children to be tested in 2020 would be 136,307. The actual number tested was 110,145, 19.2% lower than the expected number.⁴
- On October 28, 2021, the CDC announced it was lowering the Blood Lead Reference Value (BLRV) from 5 µg/dL to 3.5 µg/dL. Partly in response, the 2022 Maryland General

Assembly enacted House Bill HB 1110 (Chapter 86, Acts of 2022), which amended the timetable for implementation of the CDC’s new BLRV of 3.5 µg/dL by the state’s lead poisoning prevention programs. Under the new law, the definition of an elevated blood lead level will change from 5 µg/dL to 3.5 µg/dL on January 1, 2024 for the purpose of environmental investigations. Notification of parents and rental property owners where children with lead exposures are identified at or above 3.5 µg/dL will start earlier, however, on October 28, 2022. Although these changes do not affect the analysis of data from prior years, they significantly affect the recommendations in this report moving forward.

This evaluation examines testing and incidence rates of elevated blood lead levels in children under the age of 6 from 2010 through 2020. These data show the impacts of the universal testing strategy implemented in 2016 and provide insight to additional recommendations. While the impact on testing rates of the January, 2024 revised blood lead reference level (and the associated October, 2022 change in the level for notification) could not be evaluated as a part of this report, its potential implications are discussed in sections 3 (Revision of the Blood Lead Reference Value) and 6 (Findings and Recommendations).⁵

2. CHILDHOOD BLOOD LEAD TESTING RATES IN MARYLAND, 2010 - 2020

Blood Lead Testing Rates

Blood lead testing rates in Maryland were relatively constant overall from 2010 through 2016, then rose significantly in 2016 through 2019, until the onset of COVID-19 in March, 2020 (Figure 1).

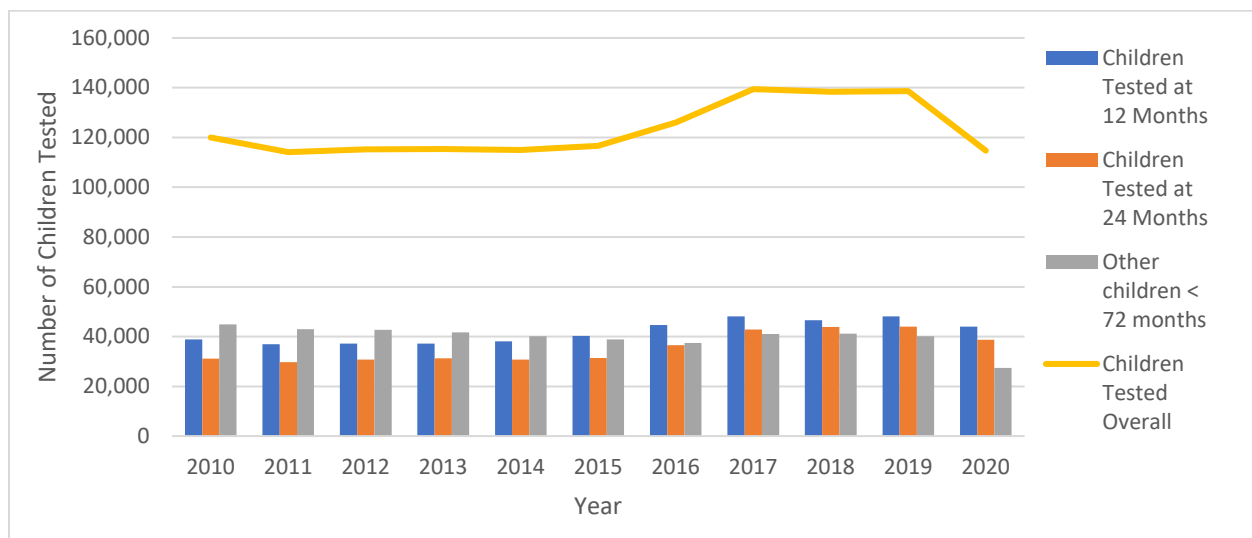


FIGURE 1. Annual number of children tested for blood lead at age 12 months, 24 months, and all other ages less than 72 months, 2010 - 2020.

Testing rates increased particularly in children aged 12 months and 24 months of age after the adoption in 2016 of regulations requiring testing of all children aged 12 and 24 months (“post-implementation period”). In both periods, blood lead testing rates were higher in children 12 months of age than in children 24 months of age (Table 1).

Year	Children Tested at 12 Months	Percent Tested at 12 Months*	Children Tested at 24 Months	Percent Tested at 24 Months*
2010	38,815	46.5	31,150	37.8
2011	36,854	43.3	29,774	35.4
2012	37,114	42.9	30,721	35.8
2013	37,133	42.2	31,224	35.8
2014	38,092	42.7	30,789	34.8
2015	40,289	44.6	31,364	34.9
2016	44,618	48.9	36,507	40.2
2017	48,045	52.2	42,768	46.6
2018	46,618	50.5	43,806	47.5
2019	48,099	51.6	43,958	47.2
2020	43,962	46.9	38,757	41.4

* Percent tested = number of children tested divided by population of children of that age in that year

TABLE 1. Blood lead testing rates of children aged 12 and 24 months in Maryland, by year, 2010 - 2020.

The annual rates of blood lead testing for children enrolled in the Medicaid Early and Periodic Screening, Diagnostic and Treatment (EPSDT) program are higher than for the population of children not insured by Medicaid, and the new 2016 regulations were expected to have less impact on the rates of testing for children enrolled in Medicaid because the prior testing requirements for them were not affected by the 2016 regulatory change. Table 2 shows the annual rates of blood lead testing for children who are enrolled in EPSDT.

Annual blood lead testing rates were compared before and after implementation of the 2016 regulations change that moved Maryland from targeted testing in certain at risk ZIP codes under the 2004 Targeting Plan, to testing of all children aged 12 and 24 months under the 2015 Targeting Plan. Briefly, the testing rates before (2010 – 2015) and after (2017 – 2019) implementation of the 2016 regulations change were compared using a segmented regression model stratified by area at risk status under the 2004 Targeting Plan (Figure 2). Because the new regulation took effect part way through the year, 2016 was omitted from the analysis.

Year	Percent Tested at 12 Months* (12-23 months of age)	Percent Tested at 24 Months* (24-35 months of age)
2010	57.5	75.6
2011	57.4	76.6
2012	57.9	75.6
2013	58.7	76.6
2014	59.9	75.6
2015	60.7	77.6
2016	60.7	78.3
2017	62.7	80.4
2018	62.2	80.8
2019	62.4	81.5
2020	62	N/A

* Percent tested = number of children tested divided by population of children of that age in that year

TABLE 2. ANNUAL RATES OF BLOOD LEAD TESTING FOR MARYLAND CHILDREN ENROLLED IN MEDICAID EPSDT, 2010 - 2020.

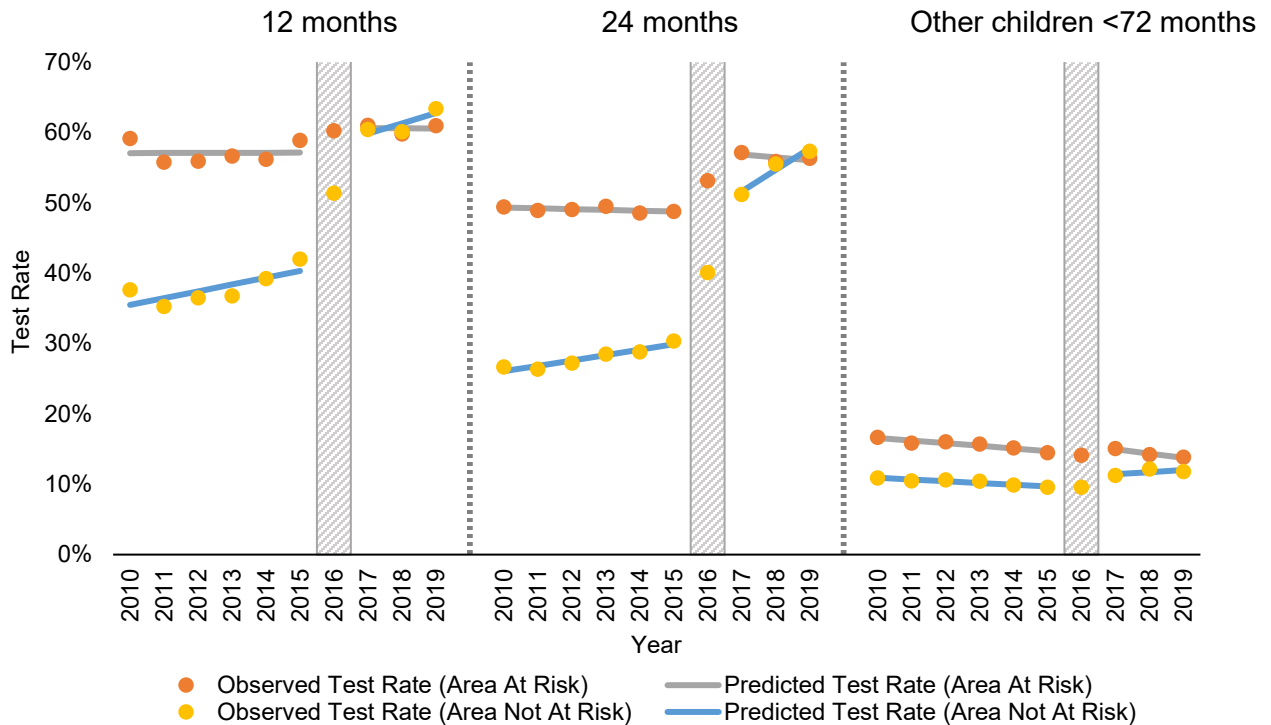


FIGURE 2. Observed and predicted childhood blood lead testing rates in Maryland before and after implementation of 2016 testing regulations.

Adoption of new requirements to test all children in the state at 12 and 24 months under the 2015 Targeting Plan was associated with an overall 10.2% increase in test rates of children age 12 months, and a statistically significant 12.4% increase for children age 24 months. As Figure 2 shows, however, the impact was significantly different depending on whether lead testing had previously been required (at risk areas) or not required (areas not at risk) under the prior regulation. In areas not at risk under the 2004 Targeting Plan, blood lead testing rates increased significantly for children at both 12 and 24 months of age. Testing rates at 12 months increased by 16.6%, while the testing rate at 24 months increased by 15.6%. By contrast, in areas that had previously been at risk under the 2004 Targeting Plan, there was a one-time 8.9% increase in blood lead testing in children at 24 months of age.

Detection of Children with Lead Exposure

Annual elevated blood lead incidence rates (the rate of children with newly identified elevated blood lead levels per 100 children tested) were compared before and after implementation of the 2015 Targeting Plan. A similar segmented regression analysis was used to estimate the change in incidence rates attributable to the regulatory changes (Figure 3). There was no significant impact of the change in testing requirements in 2016 on detection of children with elevated blood lead levels, either in areas that had previously been at risk or areas that had not. This suggests that clinical providers were already successfully identifying children with elevated blood lead levels, even when testing was not required in an area under prior regulations.

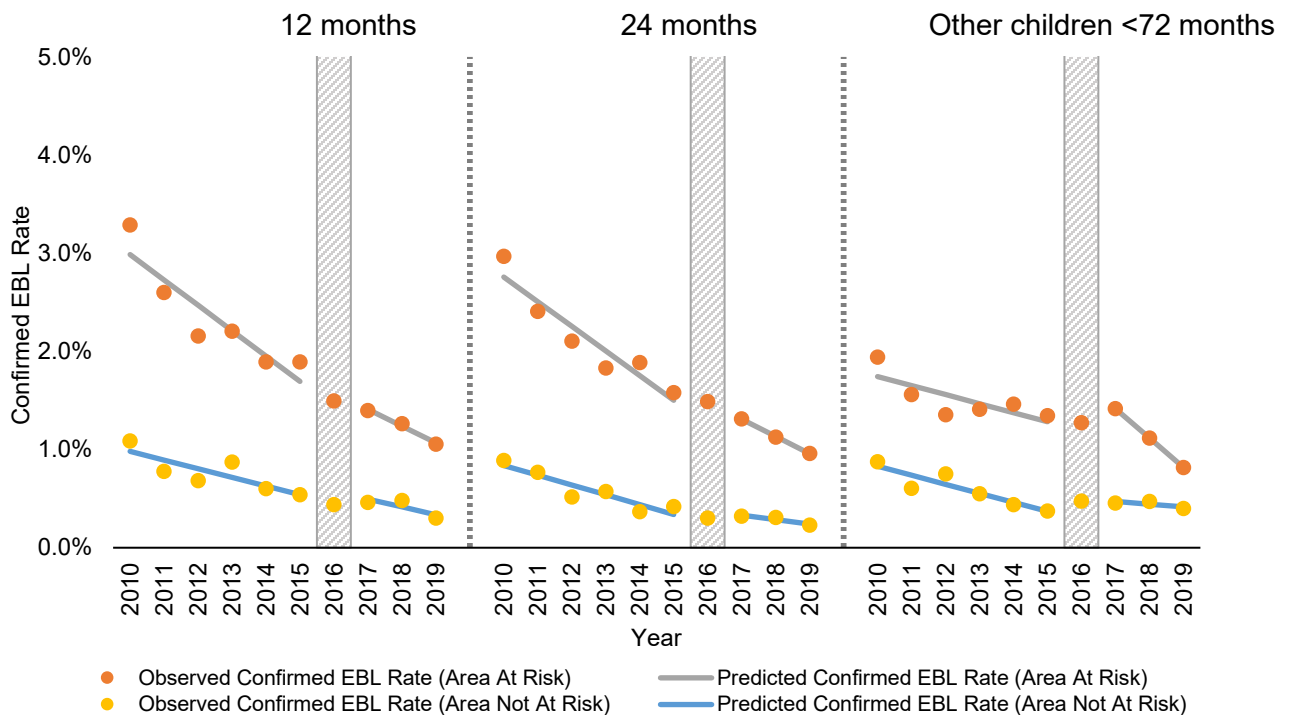


FIGURE 3. Observed and predicted childhood rates of elevated blood lead levels in Maryland before and after implementation of 2016 testing regulations.

Impacts of COVID-19

COVID-19 had a significant negative impact on childhood blood lead testing and most other well child indicators. The [2020 Annual Report of the Childhood Blood Lead Surveillance in Maryland](#) noted an overall 16.7% statewide decrease in blood lead testing, compared with 2019. The number of children tested was the lowest total since 2015. While all age groups were affected, the smallest impact was in children 12 and 24 months.

3. REVISION OF THE BLOOD LEAD REFERENCE VALUE

Following CDC's announcement in October, 2021 that it was lowering the BLRV from 5 µg/dL to 3.5 µg/dL, MDH sent a letter to health care providers on January 25, 2022 that it was endorsing the CDC level and advising them to follow up on their patients accordingly.⁶ As the letter noted, the legal definition of an Elevated Blood Lead Level in Maryland remained 5 µg/dL; under the provisions of House Bill HB 1110 (Chapter 86, Acts of 2022) the state would legally adopt the new BLRV of 3.5 µg/dL on October 28, 2022 for the purpose of notifications and case management other than environmental investigations.

The implications of the new BLRV for testing and lead poisoning prevention are significant. MDE has noted that with lower blood lead levels, several trends have emerged in their investigations of lead poisoning sources:

- While lead paint remains the most important identified source of lead exposure, particularly in jurisdictions with older housing stock, it accounts for a much smaller percentage of identified sources in many jurisdictions with newer housing stock, due to the ban of lead paint for residential use nationally in 1978. In those jurisdictions, there are a multiplicity of sources identified, including international travel, parents' occupation, hobbies, pottery or cookware, foods and spices, cosmetics, and toys (Figure 4).
- The lower the child's blood lead level, the less likely an environmental investigation will identify a specific source of exposure. MDE reports that of the 634 environmental investigations conducted between 2016 – 2018, 104 (16.4%) could not determine a source of the lead exposure.⁷

Given the above trends, it seems likely that environmental investigations for blood lead levels between 3.5 µg/dL and 5 µg/dL will have more difficulty in identifying a specific source of lead exposure than environmental investigations of children with higher blood lead levels.

The new lower BLRV also has implications for case management. Currently 11 of 24 local health jurisdictions are funded through a Health Services Initiative as a state plan amendment to the Maryland Children's Health Insurance Program (MCHP), which allows these jurisdictions to provide case management and home visiting services to children with elevated blood lead levels (or asthma) who are enrolled in or eligible for Medicaid or MCHP). The remaining jurisdictions, which account for a relatively small percentage of the children in the state with blood leads at or above the BLRV, can generally conduct case management by telephone only, without home visiting.

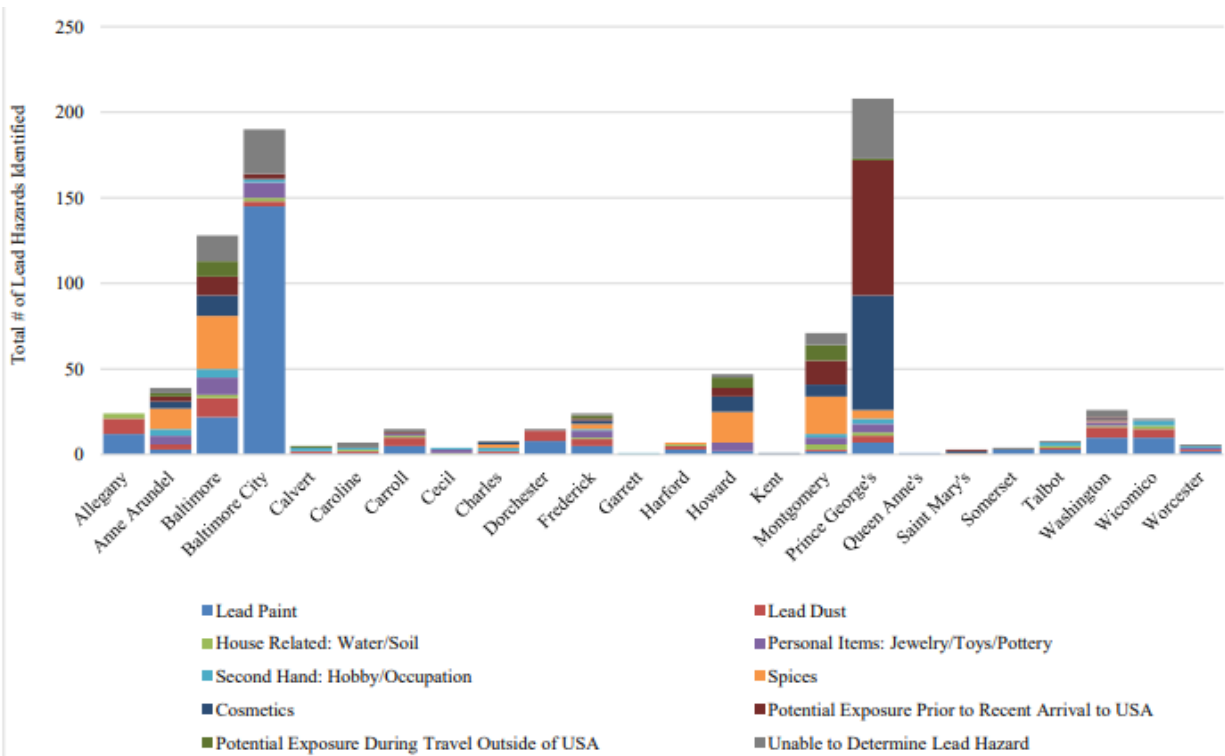


FIGURE 4. Distribution of lead sources by county (2016-2018). Source: 2018 Annual Report of the Childhood Blood Lead Surveillance in Maryland, p. 13. Accessible at: <https://mde.maryland.gov/programs/Land/Documents/LeadReports/LeadReportsAnnualChildhoodLeadRegistry/LeadReportCLR2018.pdf>.

4. OPTIONS FOR FUTURE BLOOD LEAD TESTING TARGETING STRATEGIES

To assess options for future targeting strategies, MDH considered three alternatives. The first would be to continue the current policy; the second and third alternatives would be to return to more selective testing, based on various criteria, summarized below.

- *Option 1 – Maintain current testing strategy.* This would continue universal testing of all children at 12 and 24 months of age, regardless of their place of residence in Maryland.
- *Option 2 – Resume targeted testing, based on blood lead distribution.* This option would use Childhood Lead Registry data in statistical models to predict geographic areas most likely to contain the largest number of children with elevated blood lead levels. The advantage of this approach is that it does not depend on the source of lead exposures, only on the residential address of the children exposed to lead.
- *Option 3 – Resume targeted testing, based on historical risk factors.* This option would also resume targeted testing of children at 12 and 24 months of age, based on risk models that incorporate community-level factors such as local area housing characteristics and other demographic data from the U.S. Census. This approach is

based upon the assumption that historically identified risk factors (especially a high local-area prevalence of older housing) continue to be the primary drivers of preventable childhood lead poisoning in Maryland.

Each of these options has specific strengths and weaknesses. Option 1 remains the simplest option, because it entails no change in policy or clinical guidance and is well understood by providers and parents. However, as Maryland transitions to lower lead levels, it may be particularly challenging explain the need for universal testing, rather than focusing on areas or populations with historically higher blood lead levels. While in the short run the impacts of COVID-19 and the transition to a lower blood lead reference level in 2024 justify a continuation of the current universal testing strategy, the Department notes the need to continually re-evaluate this strategy so as not to dilute efforts to increase testing in populations that have historically not had as much testing and risk potentially exacerbating inequities in testing resources and efforts.

Because Option 2 would use observed lead levels to define at risk areas, it could better account for increasingly diverse sources of lead exposure. However, it is potentially prone to other sources of bias, notably that areas with low levels of testing might not accurately reflect the actual lead burden in children in that geographic area.

Option 3 focuses on a potentially preventable hazard (lead paint) that is highly related to historical inequities in housing policy. However, it could lead to de-emphasizing other sources of exposure, and thus lead to bias against identifying lead exposures in areas where lead paint is not the primary cause of lead exposure (see Figure 4, above).

5. OTHER CONSIDERATIONS

Three other concerns have been raised with respect to potential changes in lead testing strategies:

- With increasing attention to health equity and environmental justice, an important concern for both MDH and MDE is the racial, as well as geographic, distribution of blood lead testing and elevated blood lead levels. Unfortunately, MDE has documented that only about half of the blood lead tests conducted contain information on the race/ethnicity of the child.⁸
- MDH regulations (COMAR 10.11.04.05) require documentation on a Departmental form of childhood blood lead level tests for a child to enter public pre-kindergarten, kindergarten, or first grade. There are similar requirements for children to attend licensed childcare facilities (COMAR Title 13A, Subtitles 15—18). While not directly related to the change in the BLRV, there have been requests to simplify this process for both clinical providers and parents, either through greater integration with electronic reporting, or increased integration with ImmuNet, the electronic immunization registry (lead tests are currently entered into ImmuNet in a monthly batch process, which may be

updated when MDE replaces the current system hosting the Childhood Lead Registry with a new system).

- MDE has noted that an increasing number of providers are using point of care (POC) testing in their clinics, which was a positive outcome of a 2014 task force on the topic of POC testing.⁹ There are still questions around the POC tests and their reliability to detect blood lead levels at the new lower BLRV, and MDE and MDH anticipate that this will be a source of additional questions.
- A recent national evaluation of the effectiveness of state-level policies on childhood blood lead testing rates, based on 2017-2018 blood lead testing data, shows where Maryland stands in relation to other states. Maryland's rate testing rate (30%) was sixth highest among the 34 programs whose data were sufficient to include them in the results. Only Massachusetts (48%), Rhode Island (39%), New York (36%), Connecticut (32%), and the District of Columbia (32%) had higher testing rates.³

6. FINDINGS AND RECOMMENDATIONS

The analysis of the state's new requirements to test all children in the state at 12 and 24 months under the 2015 Targeting Plan lead to the following findings:

Finding 1: Regulatory changes in 2015 and 2016, including the changes to the state's testing strategy, had a clear positive impact on blood lead testing rates, particularly in areas not previously defined as at risk for lead poisoning. These positive impacts were seen most widely in children who were 24 months of age, but were also seen in both 12 and 24 month old children in areas not previously considered to be at risk for lead poisoning. It remains to be seen whether the decreases in blood lead testing rates due to COVID-19 may return to pre-pandemic levels.

Finding 2: While the increase in blood lead testing identified more children with blood lead levels between 5 and 9 µg/dL, there was not a corresponding increase in the number of children with blood lead levels of 10 µg/dL or greater, which was the legal definition of elevated blood lead levels at the time. This suggests that even before the 2016 regulatory change, the primary care community has been identifying most of the children with elevated blood lead levels under the previous legal definition of 10 µg/dL, although it cannot be determined whether broader testing requirements in earlier years would have identified these cases sooner or prevented some of them from occurring. Both the mean blood lead level and the incidence rate continue to fall in Maryland, which suggests that prevention efforts continue to reduce overall risk to the population.

³ Ruckart PZ, Bove FJ, Dallas C. Evaluating the Effectiveness of State-Level Policies on Childhood Blood Lead Testing Rates. J Public Health Manag Pract. 2022 Sep 19. doi: 10.1097/PHH.0000000000001623. Epub ahead of print. PMID: 36126217.

Finding 3: Despite improvements, lead testing rates continue to fall below goals, and new tools are needed to promote testing and make it easier for both families and providers. Some of the tools that have been suggested to improve testing rates include:

- Reports to providers on their testing rates and appropriate benchmarks;
- Linkage of POC tests to electronic health records or otherwise eliminating the need to fax individual reports to MDE; and
- Further simplifying the lead test documentation process for children entering school, such as improving the linkage between the Childhood Lead Registry and ImmuNet or combining the lead documentation with the childhood vaccine record.

Based on these findings, MDH is making the following recommendations related to the state's blood lead testing strategy.

Recommendation 1: Maryland should continue the current strategy of defining the entire state as at risk and continue to test all children at 12 and 24 months of age. MDH and MDE should analyze the distribution of blood lead levels from January, 2023 forward in re-evaluating the state's testing strategy. At least three years of data will be required to assess the strategy and impacts of other changes underway in lead poisoning prevention in the state. Given the impacts of COVID-19 on testing rates across the entire state in 2020 (and anticipated in both 2021 and much of 2022), and the October 2022 change in the legal definition of BLRV from 5 mg/dL to 3.5 mg/dL, no change is recommended in the state's lead testing strategy at this time. Until testing rates return at least to their pre-COVID-19 levels, MDH, together with MDE, the Commission on Lead Poisoning Prevention, and other stakeholders, should conduct outreach to increase testing rates statewide. MDH and MDE should continue to evaluate testing rates and the most effective strategies to reduce the burden of lead poisoning on Maryland children and families. A minimum of three years, starting in January, 2023, will likely be required before there are sufficient data to assess these impacts clearly, which should also provide MDH and MDE sufficient time to evaluate and implement additional measures to improve data management, implement a new information management system for MDE's Childhood Lead Registry, and provide increased public access to lead testing data through MDH's Environmental Public Health Tracking Portal and similar online resources. These latter activities, together with the activities in Recommendation 2, should provide additional impetus and mechanisms to increase testing rates.

Recommendation 2: MDH and MDE should work with the provider community to increase testing rates, and improve provider reporting of blood lead test results and data on race and ethnicity. While maintaining the current testing strategy, MDH and MDE should partner with stakeholders such as Medicaid, the Lead Poisoning Prevention Commission, MedChi, Maryland Hospital Association, the state's health information exchange, the Maryland chapter of the American Academy of Pediatrics, pediatric groups, and others to implement changes that would increase, simplify, and improve provider

reporting, including some or all of the following: (1) develop a report for individual clinical providers that summarizes their lead testing history and promotes overall improvement in lead testing rates; (2) simplify reporting for point of care (POC) testing through integration with either electronic health records, the state's health information exchange, or ImmuNet; (3) MDH and MDE should continue to encourage providers to report race and ethnicity on test requisitions to improve data available to assess the equity of testing and lead hazard mitigation measures, or develop alternative means of doing so, and (4) MDH should revise its form for reporting lead testing to schools and consider integration of the form with the state's pediatric immunization form, which would simplify reporting and workflows for both providers and parents.

Recommendation 3: The new BLRV of 3.5 µg/dL will result in an increase in the number of children who require some clinical and/or case management follow up, and state agencies need to carefully evaluate the messaging, effort, resources, and health equity implications of these changes. MDH and MDE will need to monitor and carefully evaluate the impacts of the lower BLRV on critical public health goals related to lead poisoning prevention, including: (1) the number of environmental investigations conducted and their success in identifying a source of exposure; (2) the distribution of different sources of lead exposure and whether they are subject to mitigation; (3) the race/ethnicity, socio-economic, and geographic distribution of blood lead levels at or above the Blood Lead Reference Value; (4) the impacts and workload requirements on both MDE and the public health workforce; and (5) the impacts and workload requirements on both clinical providers and case managers in local health departments, and whether there are any additional measures that can be taken to mitigate those impacts.

GLOSSARY OF TERMS

Blood lead incidence rate: the number of children newly identified with a given blood lead level per 1,000 children in a given period of time, typically a year.

Blood lead reference value (BLRV): the term adopted by the U.S. Centers for Disease Control and Prevention (CDC) in 2012 to replace “level of concern”, in recognition that there is no level of lead in the body that should not be of concern to health care providers. The BLRV represents the blood lead level of the top 2.5% of the children tested for lead in the most recent National Health and Nutrition Examination Survey (NHANES).

CDC: U.S. Centers for Disease Control and Prevention.

Elevated blood lead level: The term used in Maryland statute to define a blood lead level at which or above there is a legal or regulatory action required.

EPSDT: Medicaid Early and Periodic Screening, Diagnostic and Treatment.

Level of concern: The term used by CDC prior to adoption of the BLRV.

MDE: Maryland Department of the Environment.

MDH: Maryland Department of Health (formerly Maryland Department of Health and Mental Hygiene, DHMH).

µg/dL: Micrograms per deciliter, the units for blood lead concentration or blood lead levels in children.

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¹ Accessible online at: <https://phpa.health.maryland.gov/OEhfp/eh/Pages/Lead.aspx>

² <https://www.youtube.com/watch?v=B1ycx4DtPfY>

³ <https://www.youtube.com/watch?v=aJ6QGcBB0Nc>

⁴ Maryland Department of the Environment, Lead Poisoning Prevention Program. 2020 Annual Report of Childhood Blood Lead Surveillance. Accessible at:

<https://mde.maryland.gov/programs/land/Documents/LeadCommission/2020%20Annual%20Report%2c%20Childhood%20Blood%20Lead%20Surveillance%20in%20Maryland%20%282%29.pdf>

⁵ Ruckart PZ, Jones RL, Courtney JG, et al. Update of the Blood Lead Reference Value — United States, 2021. MMWR Morb Mortal Wkly Rep 2021;70:1509–1512. DOI:

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⁶ MDH Letter to Clinicians, January 25, 2022. “Guidance for Providers Regarding New CDC Blood Lead Reference Level and Other Matters Pertaining to Lead Testing for Children.”

Accessible at:

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⁷ Maryland Department of the Environment, Lead Poisoning Prevention Program. 2019 Annual Report of Childhood Blood Lead Surveillance (p. 14). Accessible at:

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⁸ Maryland Department of the Environment, Lead Poisoning Prevention Program. 2019 Annual Report of Childhood Blood Lead Surveillance, p. 10.

⁹ Maryland Department of Health, 2014. Report to the General Assembly by the Task Force on Point of Care Testing for Lead Poisoning, Chapter 365. Accessible at:

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