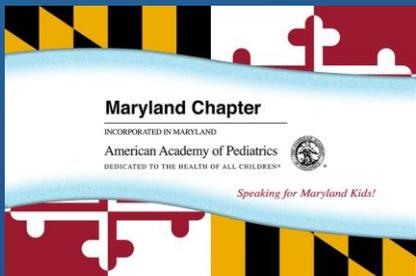


MDAAP/AAP Lead Testing ECHO

October 5, 2022

Session 1: Lead Exposure in Maryland
and CDC/AAP Recommendations

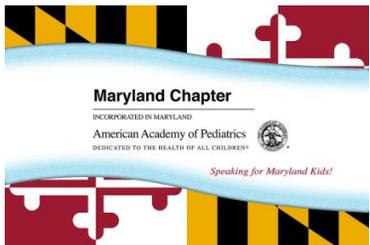


American Academy of Pediatrics
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ACKNOWLEDGMENTS

- This project was supported by the Cooperative Agreement Number, NU38OT000282, funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the project faculty and staff and do not necessarily represent the official views of the American Academy of Pediatrics, Centers for Disease Control and Prevention or the Department of Health and Human Services.



HOUSEKEEPING

- For educational and quality improvement purposes, this teleECHO session will be recorded
 - By participating in this session, you are consenting to be recorded – we appreciate and value your participation
- To protect patient privacy, please do not provide any protected health information (PHI)
- Please mute your microphone when not speaking
- **Please enable your video if possible**
- Chat with Loretta I. Hoepfner in Chatbox if you need technical assistance



AGENDA

- Welcome – Loretta I. Hoepfner
- Lecture Presentation – Paul Rogers and Mike Ichniowski
- QI Data Review – Troy Jacobs
- Case Presentation – Paul Rogers
- Case Discussion – All
- Follow Up and Next Steps – Loretta I. Hoepfner



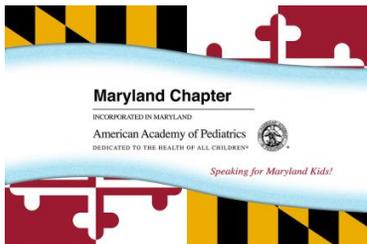
TODAY'S LECTURE

Lead Exposure in Maryland and CDC/AAP Recommendations

Paul T. Rogers, MD, MBA, FAAP

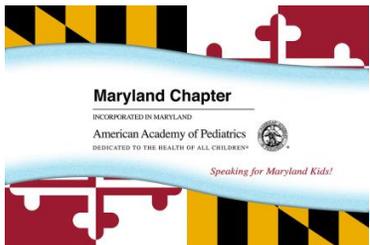
Michael Ichniowski, MD, FAAP

October 5, 2022

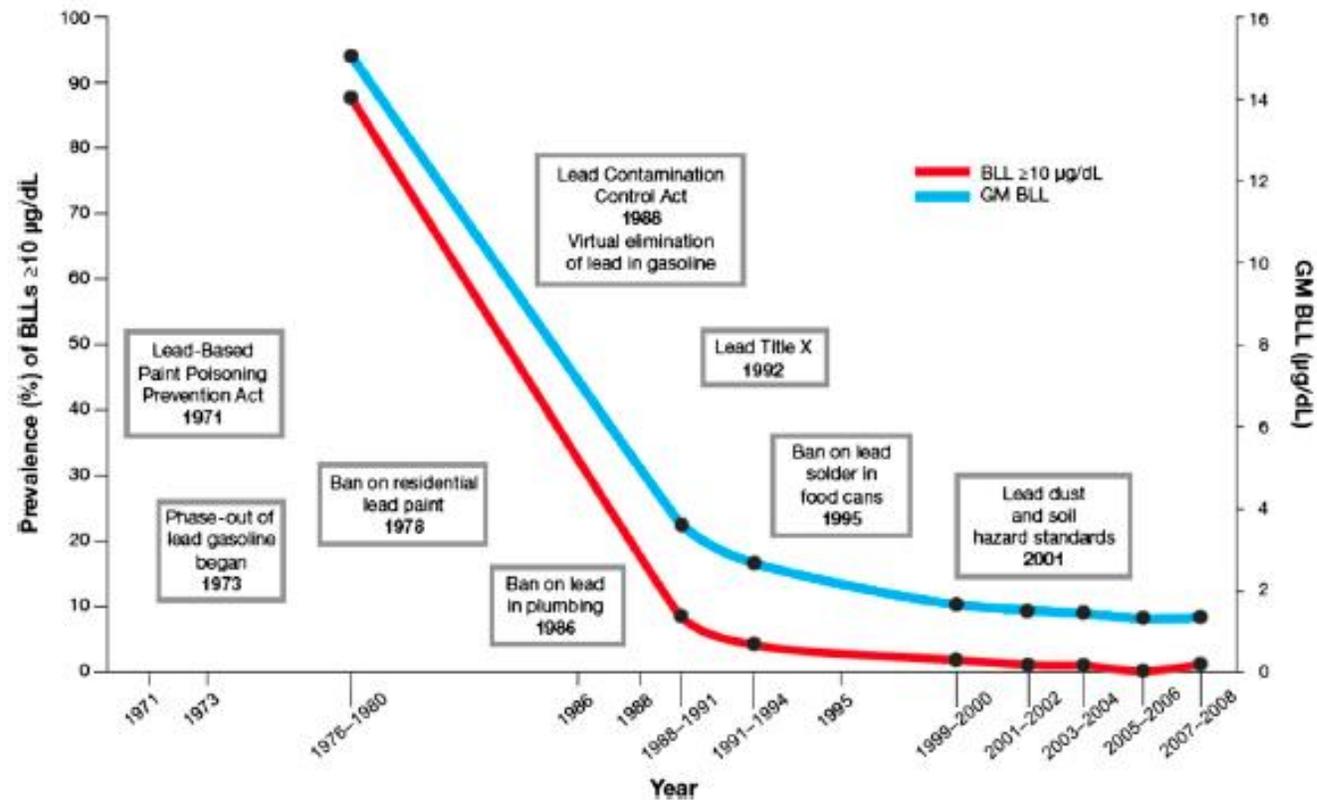


LEARNING OBJECTIVES

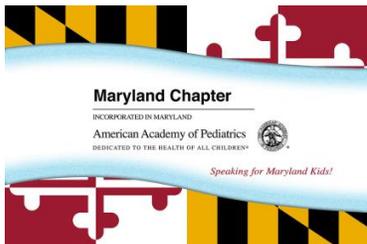
- Review prevalence of lead exposure in Maryland.
- Review the impact of health inequities on lead exposure.
- Review AAP and Maryland Department of Health guidance regarding lead screening and testing.
- Discuss the impact of the COVID-19 pandemic on lead exposure.



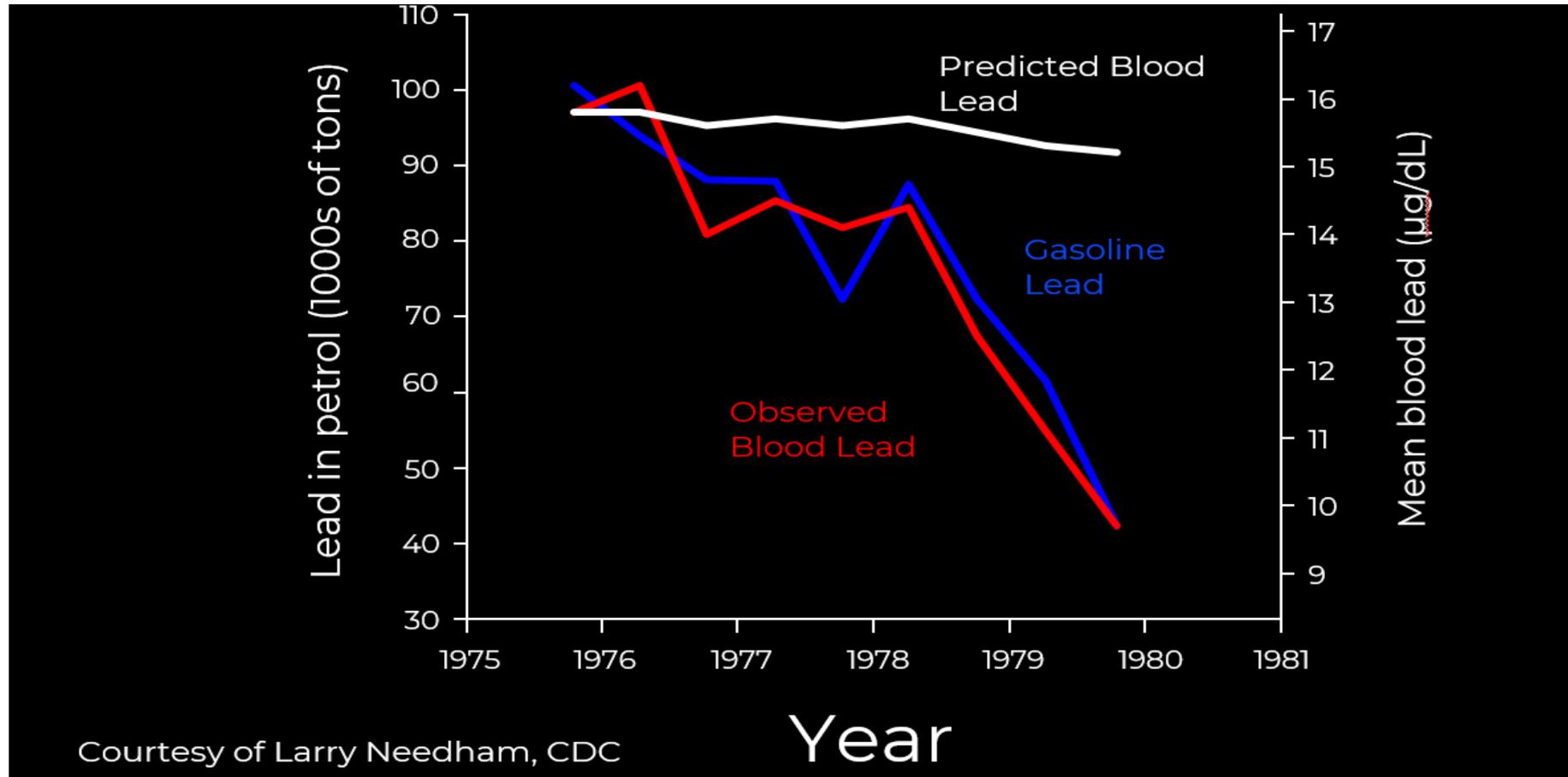
DOWNWARD TRENDS: HISTORICAL SIGNPOSTS



Source: AAP COUNCIL ON ENVIRONMENTAL HEALTH. Prevention of Childhood Lead Toxicity. *Pediatrics*. 2016;138(1):e20161493



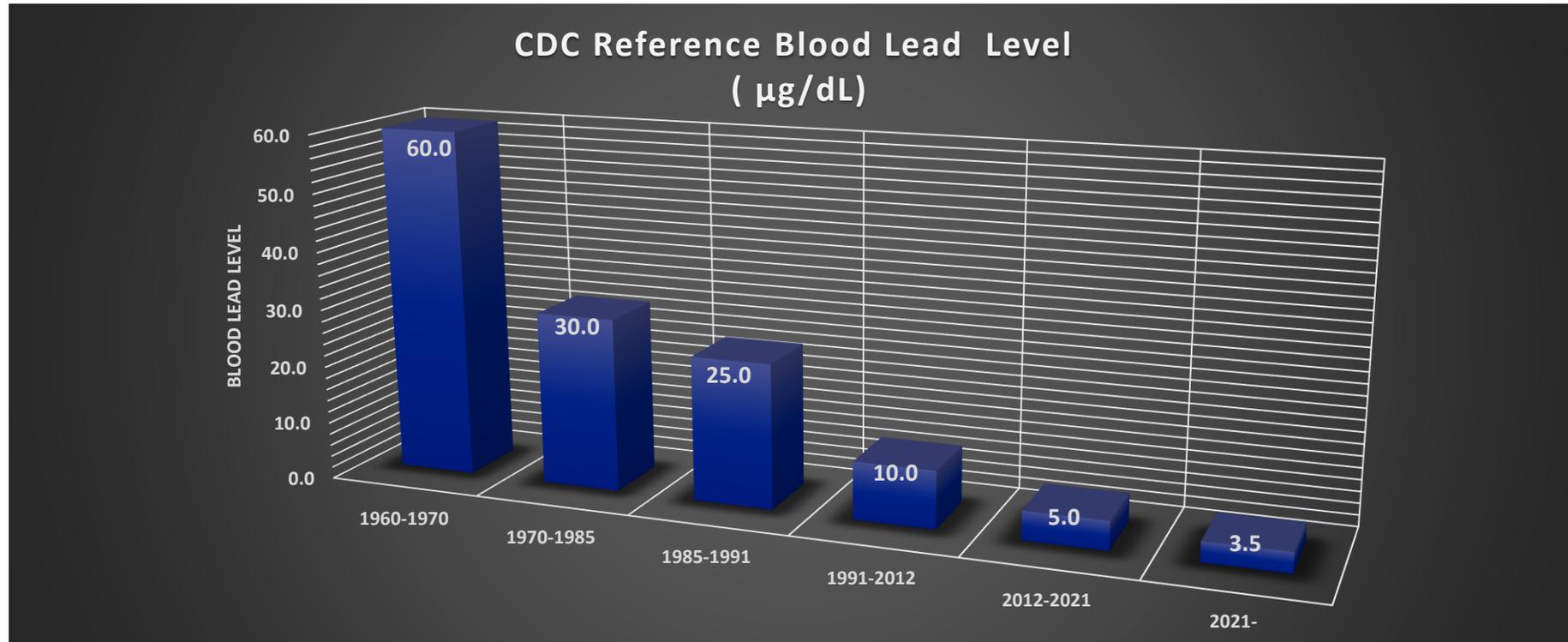
DECLINE IN BLOOD LEAD LEVELS WITH THE PHASE-OUT OF LEADED GASOLINE



Thanks to Dr. Bruce Lanphear



DOWNWARD TRENDS: REFERENCE BLOOD LEAD LEVELS



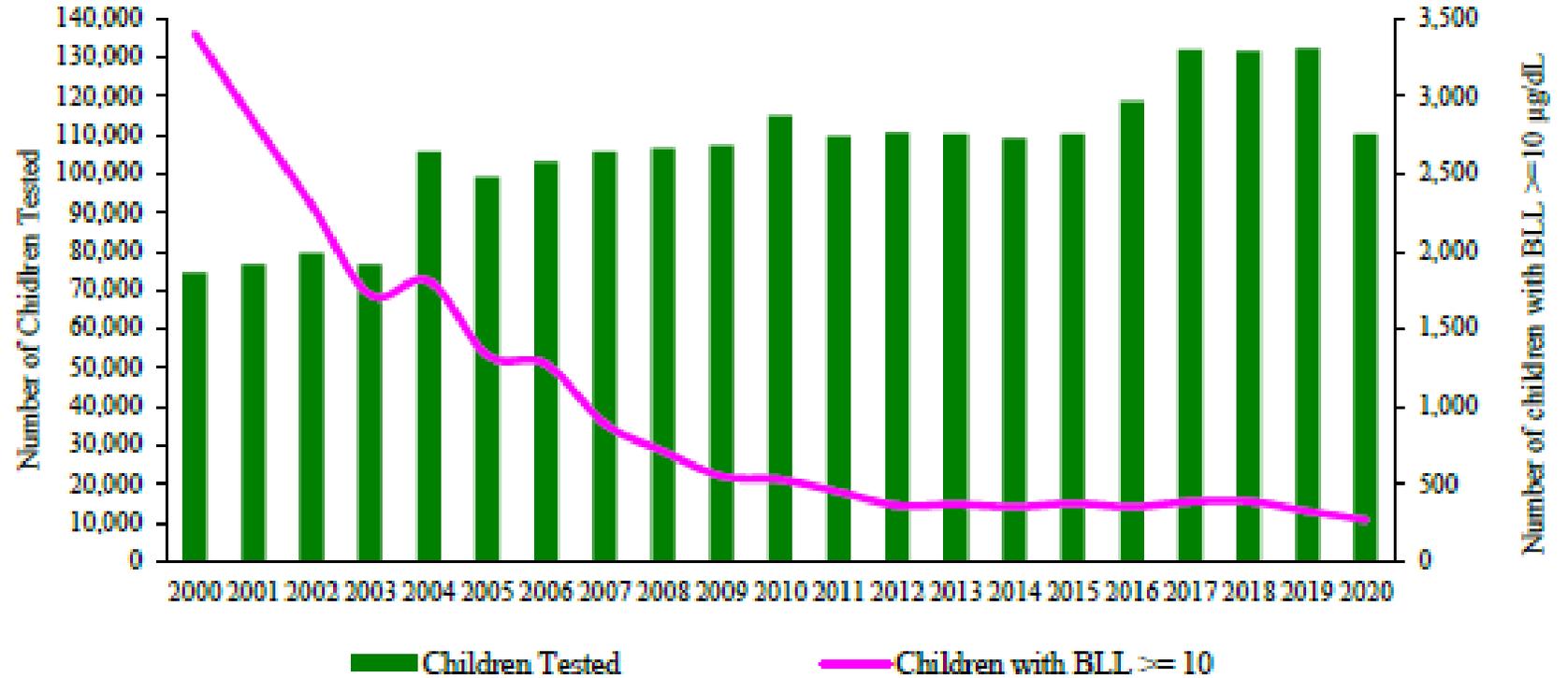
Source: modified from: Agency for Toxic Substances and Disease Registry - CDC

https://www.atsdr.cdc.gov/csem/leadtoxicity/safety_standards.html

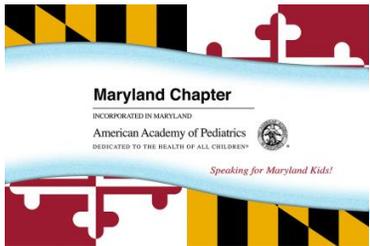


STILL TREATING LEAD POISONING AFTER ALL THESE YEARS

Number of Children 0-72 Months in Maryland tested for Lead and Number Reported to Have Blood Lead Levels $10 \mu\text{g}/\text{dL}$: 2000-2020

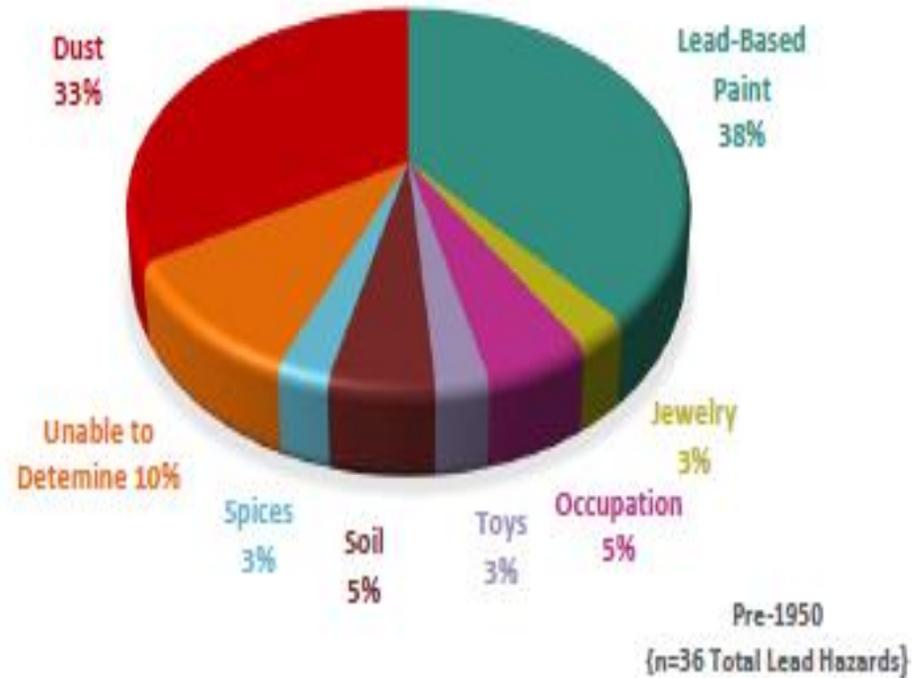


From Maryland Department of the Environment annual report, October 2020:
<https://mde.maryland.gov/programs/land/leadpoisoningprevention/pages/healthcare.aspx>

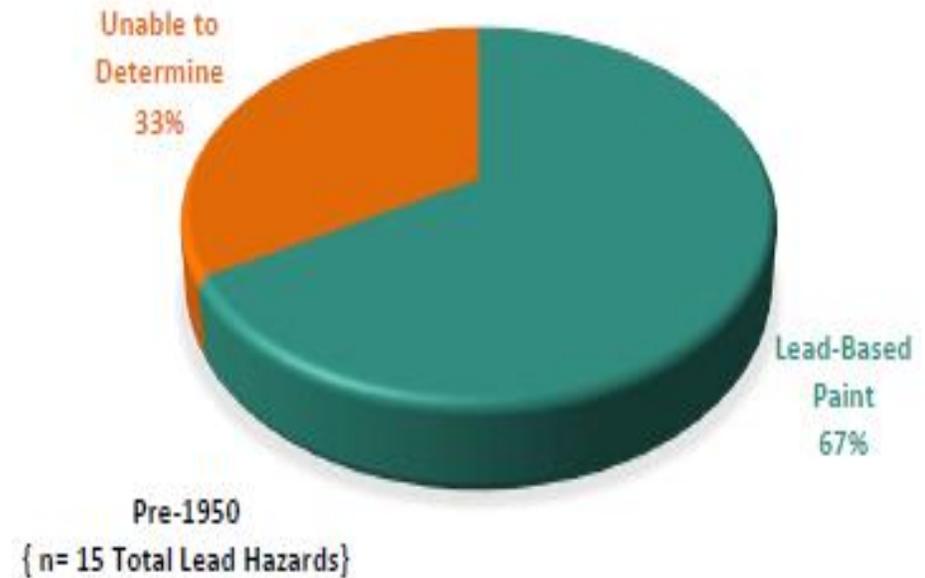


SOURCES OF LEAD POISONING IN MARYLAND

Lead Hazards Identified in Rental Housing Maryland Counties CY20



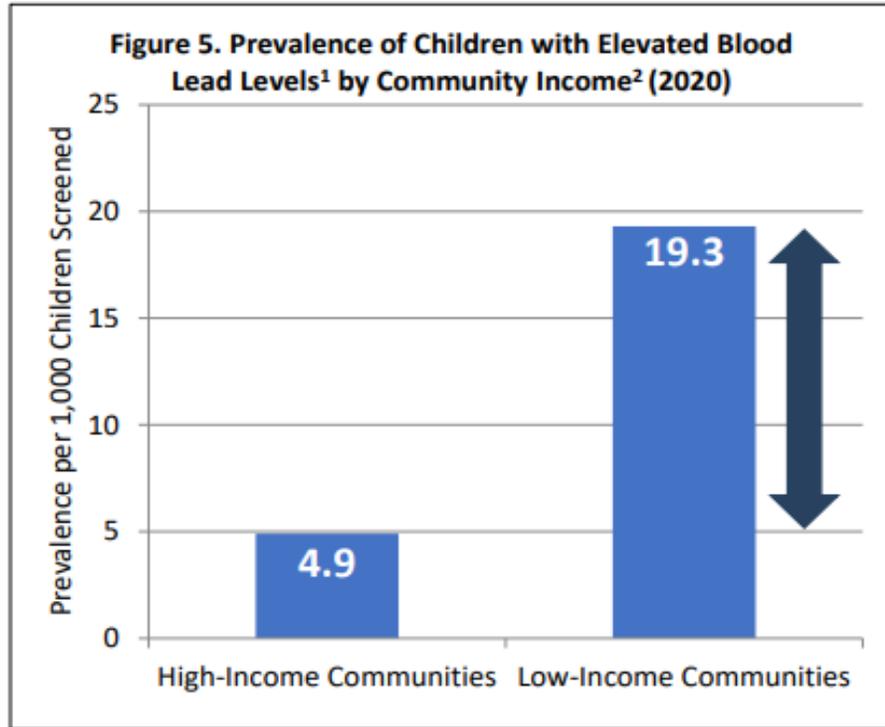
Lead Hazards Identified in Rental Housing Baltimore City CY20



From Maryland Department of the Environment annual report, October 2020:
<https://mde.maryland.gov/programs/land/leadpoisoningprevention/pages/healthcare.aspx>

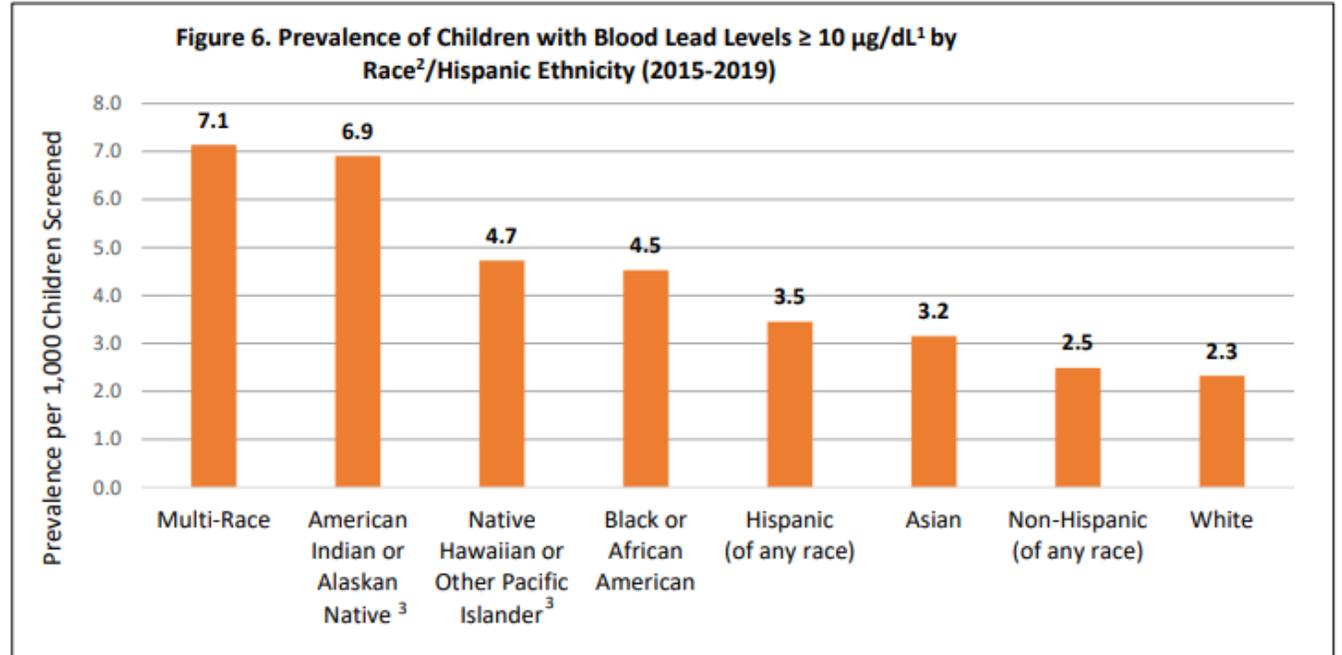


HEALTH INEQUITY AND LEAD



¹Includes confirmed BLLs (one venous or two capillary blood tests $\geq 5 \mu\text{g}/\text{dL}$ within 84 days) and a proportion of unconfirmed blood lead tests (single capillary tests) for children 9-47 months of age.

²Lowest versus highest quartile of families living at or below 200% of the Federal Poverty threshold using poverty to income ratio data from the U.S. American Community Survey.



¹Includes poisoned BLLs (defined as a venous test result $\geq 10 \mu\text{g}/\text{dL}$) and results for children with two capillary tests $\geq 10 \mu\text{g}/\text{dL}$ drawn within 84 days of each other for children between 9 and 47 months of age.

²Each race category includes those of Hispanic and Non-Hispanic ethnicities.

³Prevalence values may be unstable due to small case counts.

Source: Massachusetts Dept of Public Health, CLPPP 2020: <https://www.mass.gov/doc/2020-annual-childhood-lead-poisoning-surveillance-report/download>

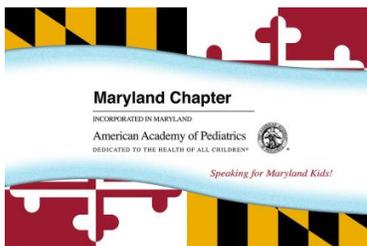
MARYLAND CHILDHOOD BLOOD LEAD SURVEILLANCE

- Since 1995 the Childhood Lead Registry has released a comprehensive annual report on statewide childhood blood lead testing.
- The report provides a detailed breakdown of blood lead data by age, jurisdiction, blood lead level, incidence, and prevalent cases.



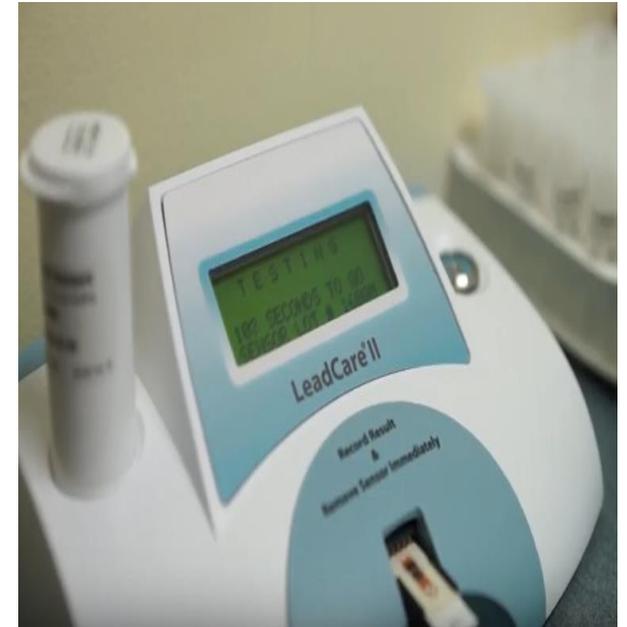
CHILDHOOD BLOOD LEAD SURVEILLANCE IN MARYLAND

https://mde.maryland.gov/Documents/LeadWeek2020/AnnualReportOS_Final.pdf

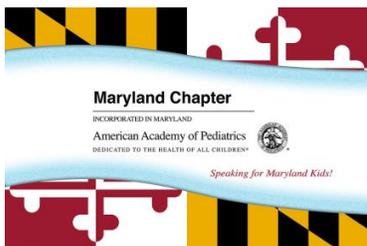


MARYLAND DEPARTMENT OF HEALTH TESTING REQUIREMENTS

- Maryland health care providers must test all children between the ages of 12 and 24 months for lead, using either a capillary test or a venous blood draw.
- Maryland Department of the Environment continues to notify parents, property owners, and local health departments about children with blood lead levels of ≥ 5 $\mu\text{g}/\text{dL}$ and continues to conduct environmental investigations for those children.



https://health.maryland.gov/phpa/OEHFP/EH/Shared%20Documents/Lead/Physician%20follow-up%20Lead%20Letter_01252022.pdf



MARYLAND DEPARTMENT OF HEALTH TESTING REQUIREMENTS

Table 1: Recommended Schedule for Obtaining a Confirmatory Venous Sample for a Capillary Fingerstick or Heelstick		Table 2: Schedule for Follow-Up Blood Lead Testing following a Confirmed Blood Lead at or above the Blood Lead Reference Value ^a		
Blood Lead Level (µg/dL)	Time to Confirmation Testing	Venous Blood lead Levels (µg/dL)	Early follow up testing (2-4 tests after identification)	Later follow up testing after BLL declining
≥3.5–9	Within 3 months*	≥3.5–9	3 months**	6–9 months
10–19	Within 1 month*	10–19	1–3 months**	3–6 months
20–44	Within 2 weeks*	20–44	2 weeks–1 month	1–3 months
≥45	Within 48 hours*	≥45	As soon as possible	As soon as possible

*The higher the BLL on the initial screening capillary test, the more urgent the need for confirmatory testing using a venous sample.

^aSeasonal variation of BLLs exists and may be more apparent in colder climate areas. Greater exposure in the summer months may necessitate more frequent follow ups.

^{**}Some case managers or healthcare providers may choose to repeat blood lead tests on all new patients within a month to ensure that their BLL level is not rising more quickly than anticipated.

https://health.maryland.gov/phpa/OEHFP/EH/Shared%20Documents/Lead/Physician%20follow-up%20Lead%20Letter_01252022.pdf

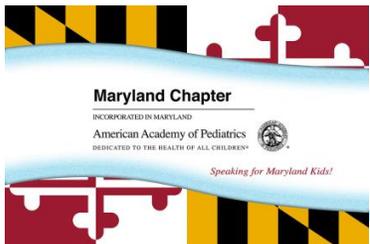


TESTING RECOMMENDATIONS AAP

- Risk assessment at well-child visits: 6 months, 9 months, 12 months, 18 months, 24 months, and at 3, 4, 5 and 6 years.
- Test children if they live in or visit a home or childcare facility with an **identified lead hazard** or a **home built before 1960** that is in poor repair or was renovated in the past 6 months.
- Test blood lead level only if the risk assessment is positive.
- Universal testing of children 12 and 24 months is a Maryland requirement.

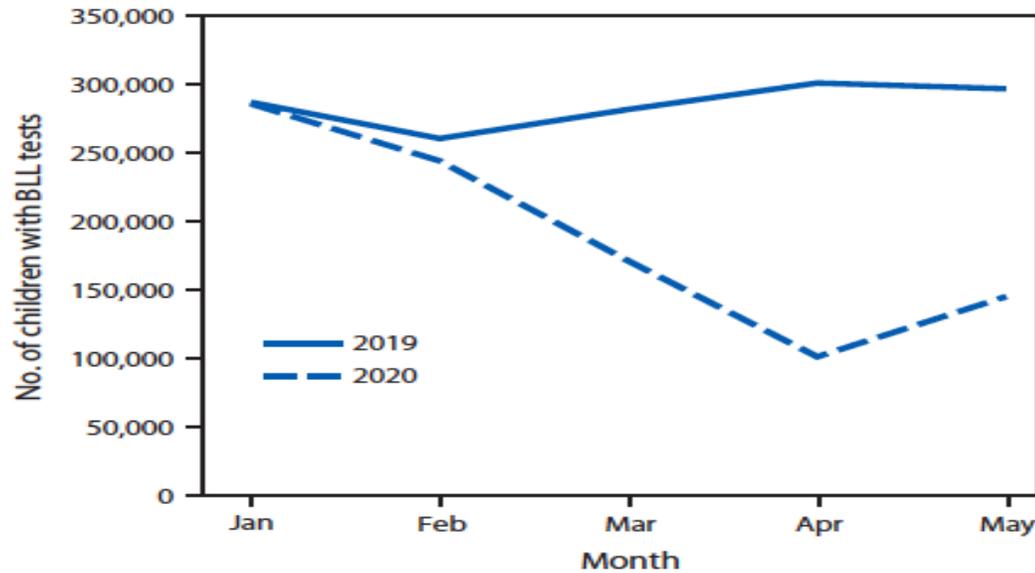


<https://www.aap.org/en/patient-care/lead-exposure/detection-of-lead-poisoning/>



PANDEMIC IMPACT ON LEAD EXPOSURE

FIGURE. Number of children aged <6 years who received blood lead level (BLL) tests,* by month — 34 U.S. jurisdictions,† 2019–2020

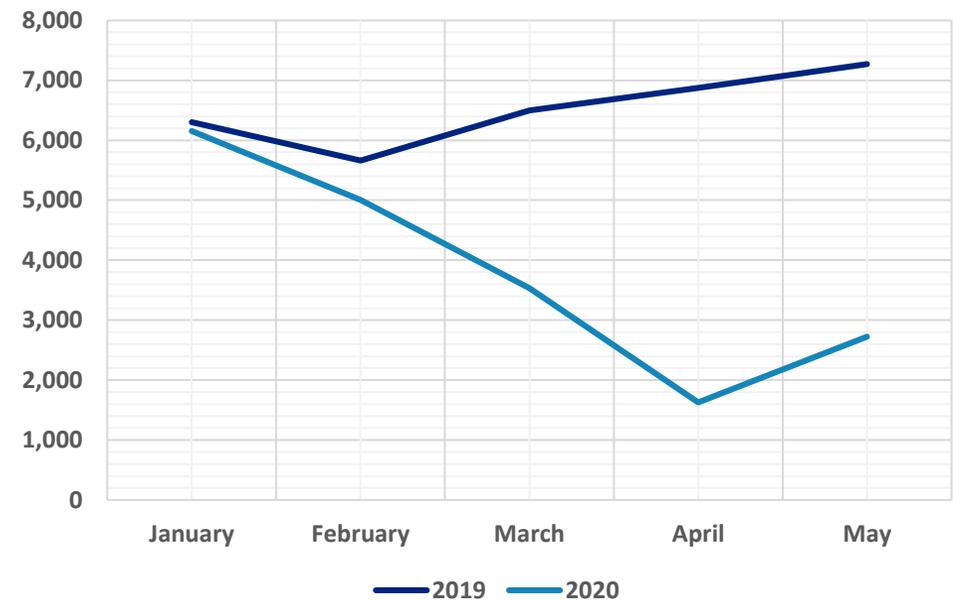


* CDC requested that state and local health departments report the total number of children with BLL tests by month during January–May 2019 and January–May 2020. Data for children aged <6 years were received from 34 state and local health departments, including the District of Columbia and New York City.

† Alabama, Alaska, Arizona, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Hampshire, New Mexico, New York (excluding New York City), New York City, Ohio, Oregon, Rhode Island, Tennessee, Texas, Washington, West Virginia, and Wisconsin.

[Courtney JG et al. CDC, MMWR. Decreases in young children who received blood lead level testing during COVID-19 – 34 jurisdictions, January–May 2020 Feb 5, 2021; 70 (5): 155-161.]

Number of MD Children Tested 2019 & 2020 < 6 Years (Electronic reports only)



From Maryland Department of the Environment annual report, October 2020:
<https://mde.maryland.gov/programs/land/leadpoisoningprevention/pages/healthcare.aspx>



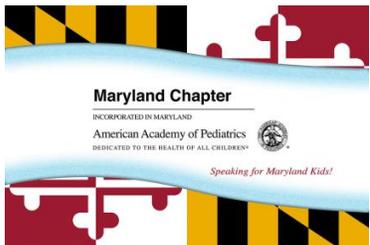
LEAD EXPOSURE DURING COVID-RELATED SHELTER-IN-PLACE

- **Economic:** Job loss, fewer resources to tap for lead abatement.
- **Foreclosure/eviction:** Loss of home and security.
- **Food insecurity:** Dietary deficiencies in iron, calcium, vitamin D, and magnesium.
- **Children & parents at home 24/7:** Stress, increased lead exposure.
- **Do-It-Yourself projects:** Increased risk of lead contamination.
- **Fear of clinic and public transportation:** Delayed well child visits, reduced case findings.
- **Early intervention:** Access, equity, cultural bias, & disabilities
- **Telehealth since May 2020**



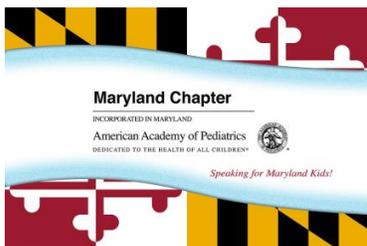
SUMMARY

The need for timely lead screening and testing has increased due to the impact of families sheltering in place during the pandemic.



RESOURCES

- **Mid-Atlantic Center for Children’s Health & the Environment**
Pediatric Environmental Health Specialty Unit
866-622-2431
kidsandenvironment@georgetown.edu
www.pehsu.net/region3.html
- **Mt. Washington Pediatric Hospital Lead Treatment Program**
410-367-2222
www.mwph.org
- **Maryland Poison Control**
800-222-1222
- **Maryland Department of Health (MDH)**
(410) 767-6500 or 1-877-463-3464
dhmh.envhealth@maryland.gov
<https://health.maryland.gov/phpa/oehfp/eh/pages/lead.aspx>
- **Maryland Department of the Environment**
Lead Poisoning Prevention Program
410-537-3825/800-776-2706
<http://www.mde.state.md.us/programs/Land/LeadPoisoningPrevention/Pages/index.aspx>
- **Local Health Departments’ Websites**
<https://health.maryland.gov/Pages/departments.ASPX>
- **Centers for Disease Control and Prevention**
www.cdc.gov/nceh/lead/
- **Green & Healthy Homes Initiative**
410-534-6447
800-370-5223
www.greenandhealthyhomes.org/



Lead Poisoning Toolkit 2022

Guidelines For Maryland Practitioners

Maryland Chapter American Academy of Pediatrics

Paul T. Rogers MD MBA FAAP

Michael Ichniowski MD FAAP



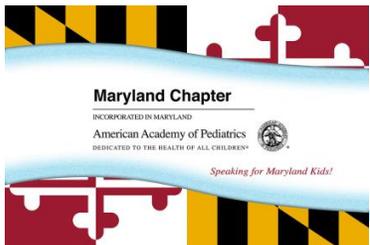
<https://www.mdaap.org/ehcc/>

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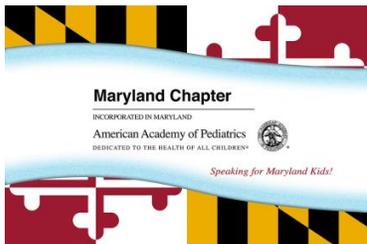


QUESTIONS?

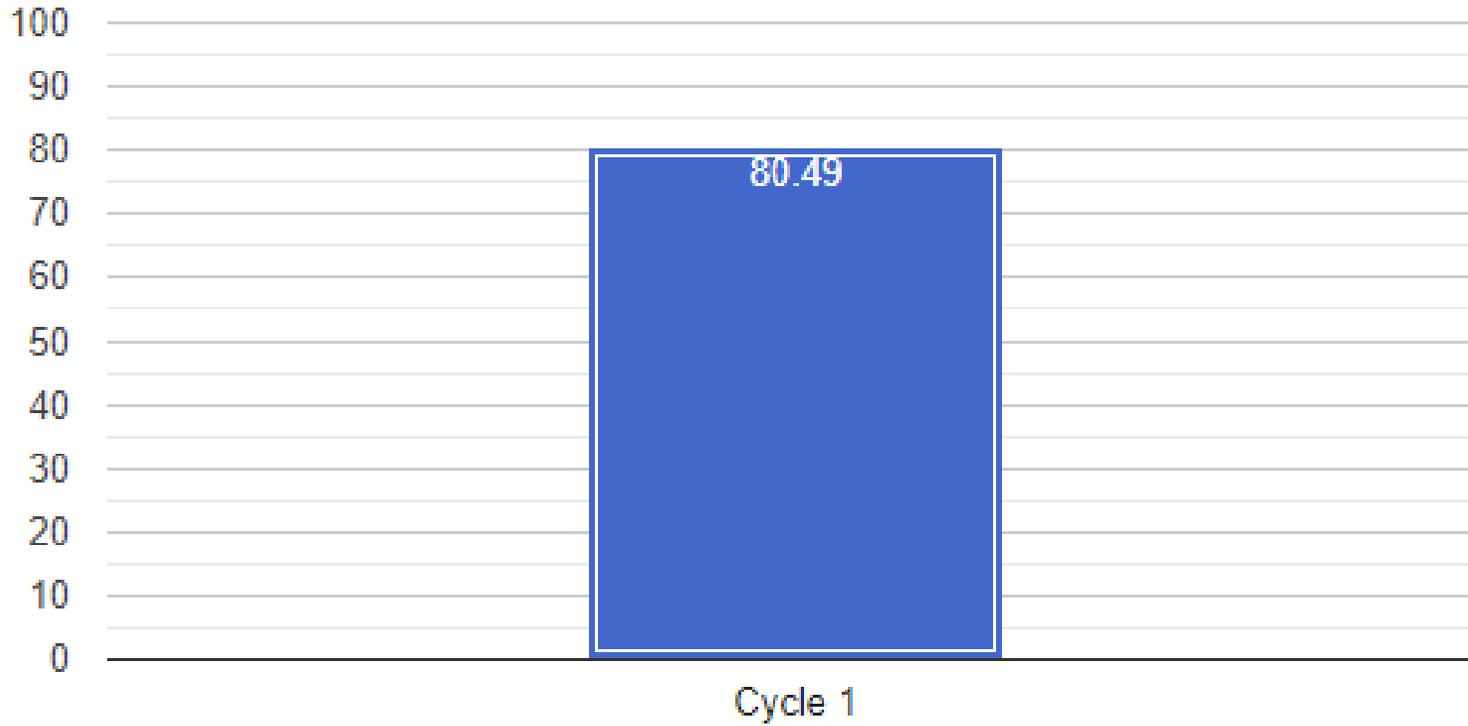


QI DATA REVIEW

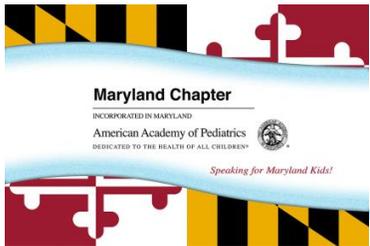
Troy A. Jacobs, MD, MPH, FAAP



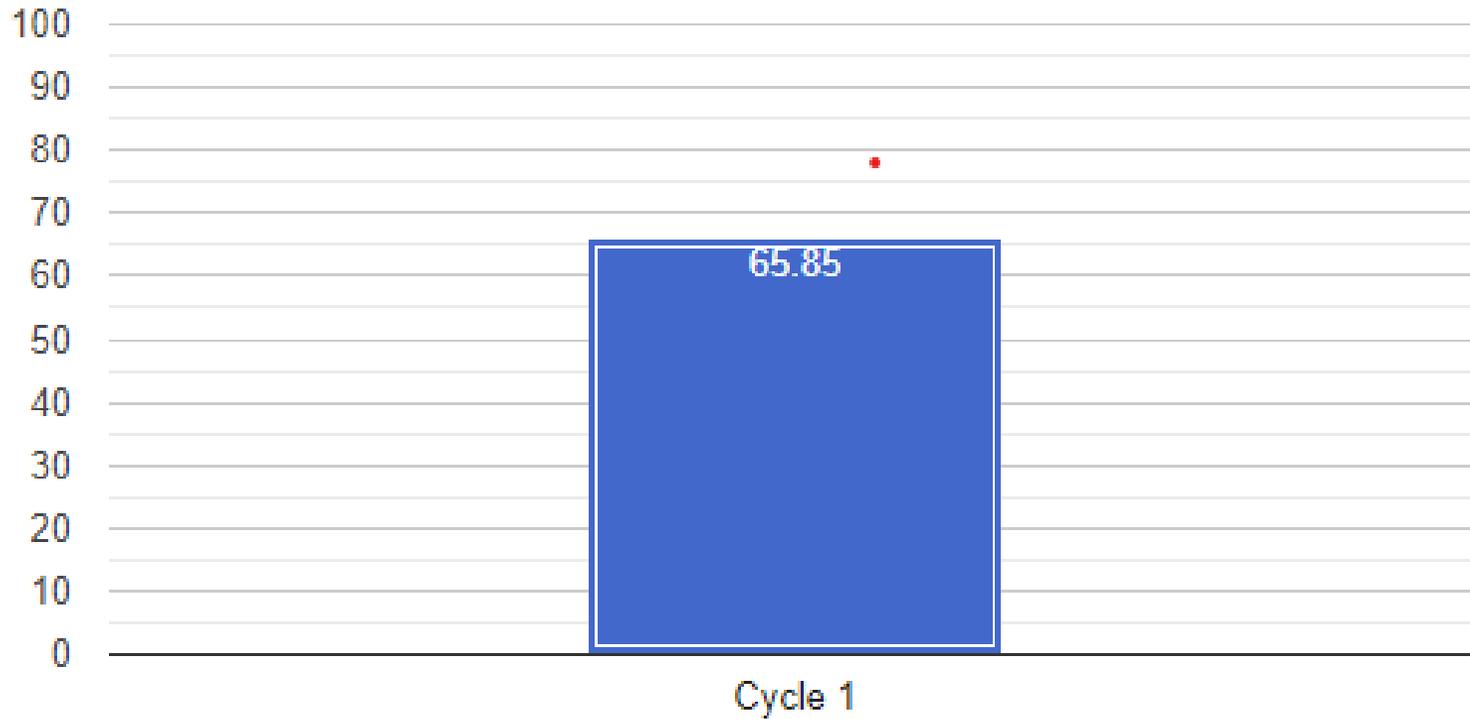
Risk Assessment



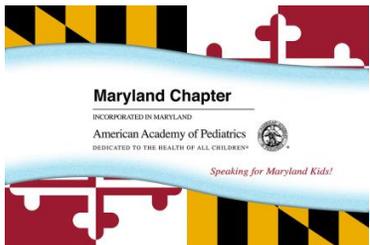
All Groups
Cycle 1 (N = 41)



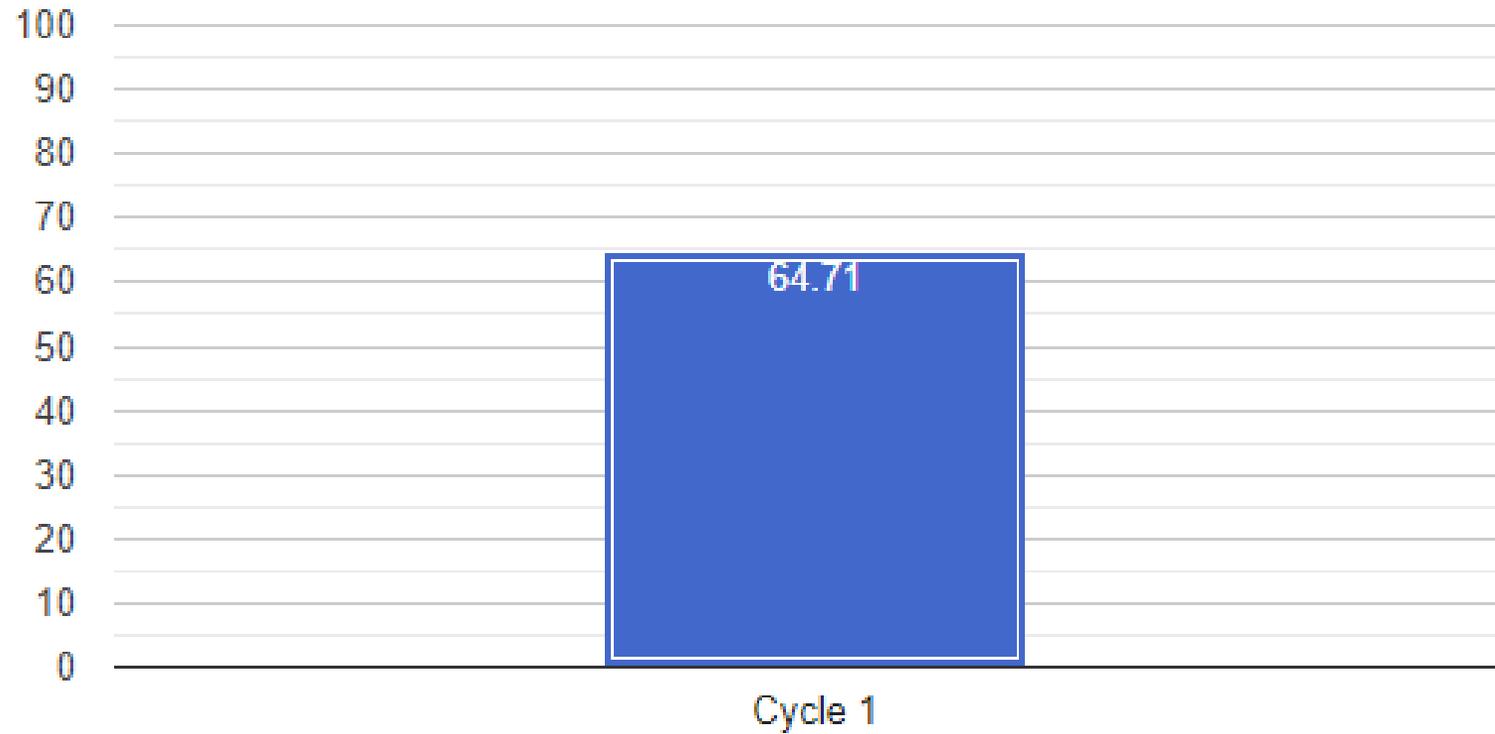
Documented Initial Blood Lead Test



All Groups
Cycle 1 (N = 41)



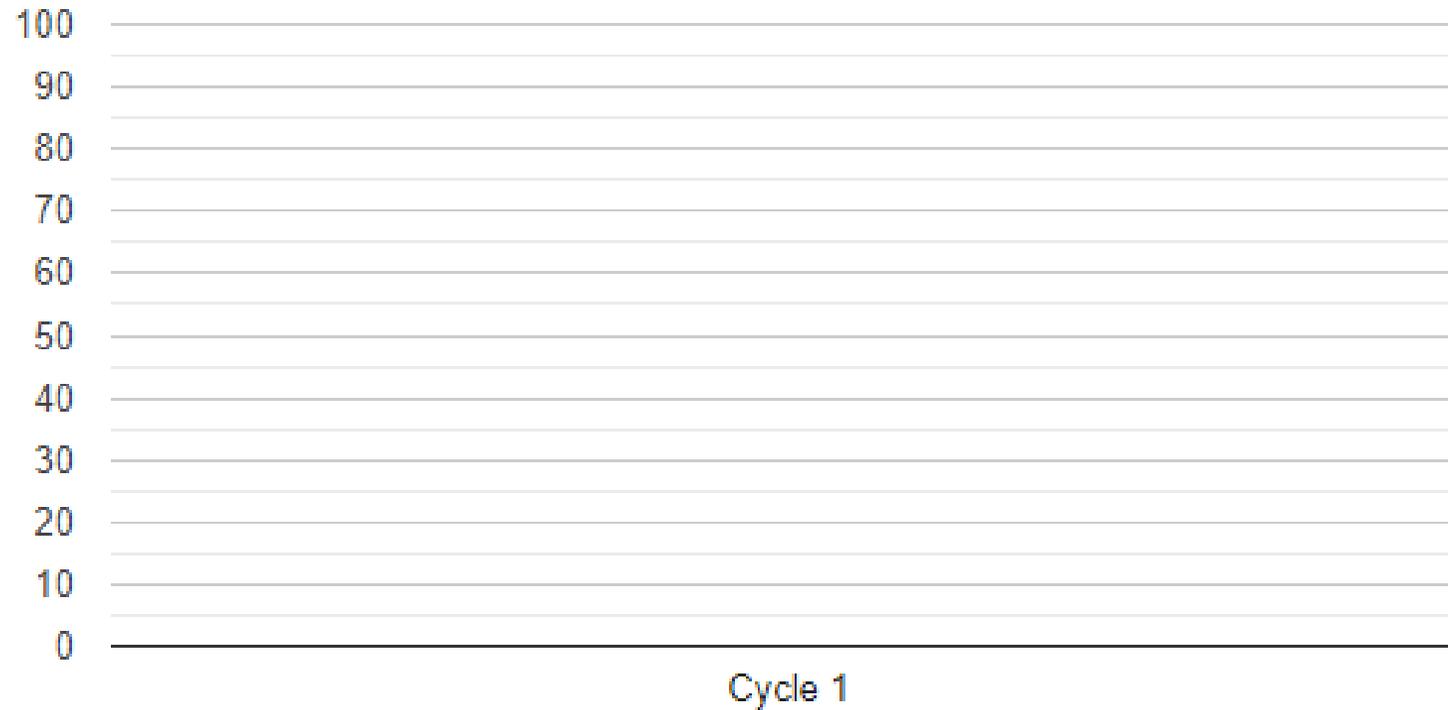
Blood Lead Testing



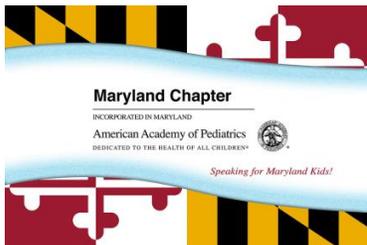
■ All Groups
Cycle 1 (N = 17)



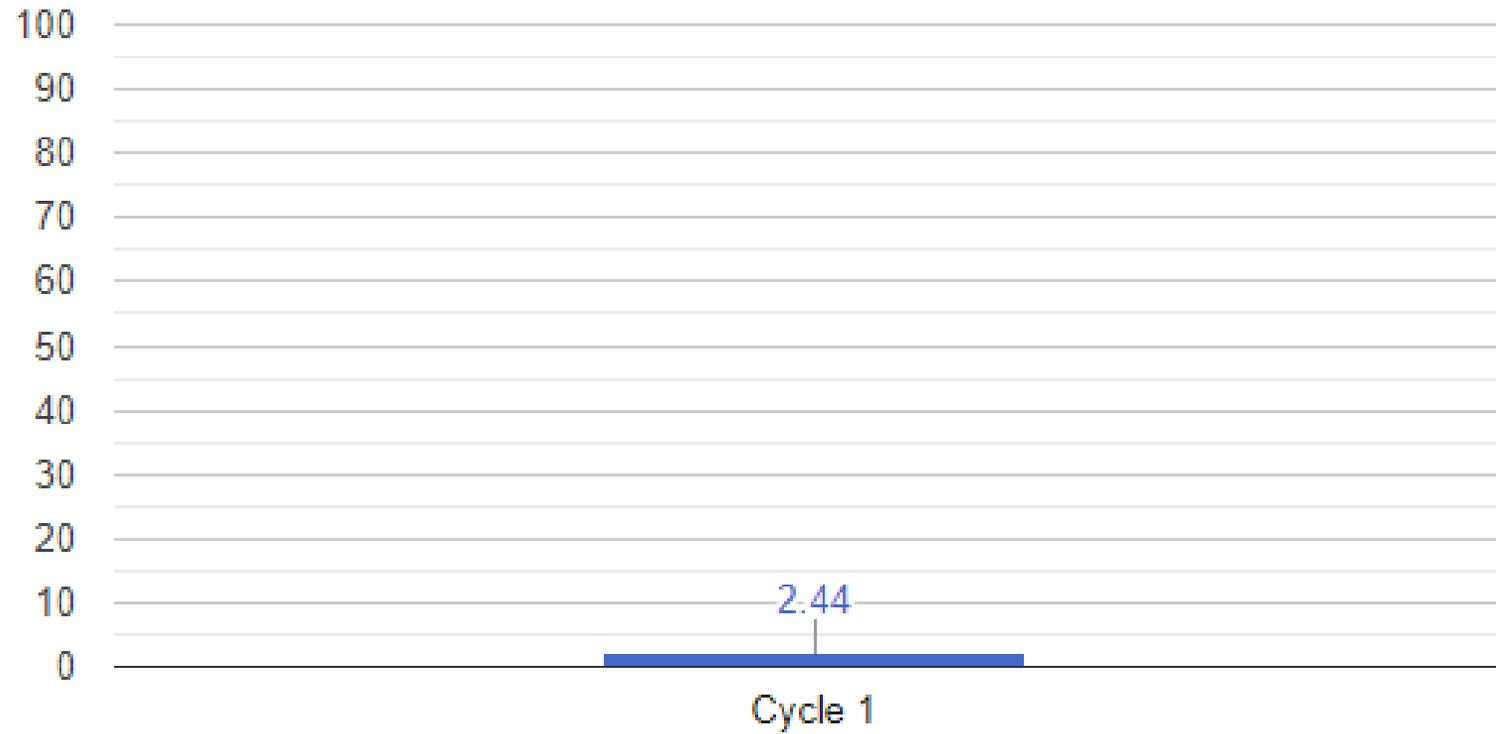
Blood Lead Results Interpretation (Follow Up Testing)



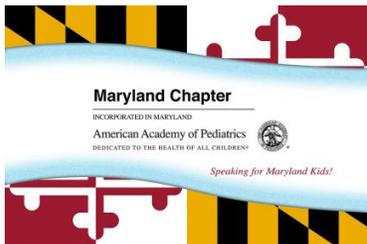
■ All Groups
Cycle 1 (N = 0)



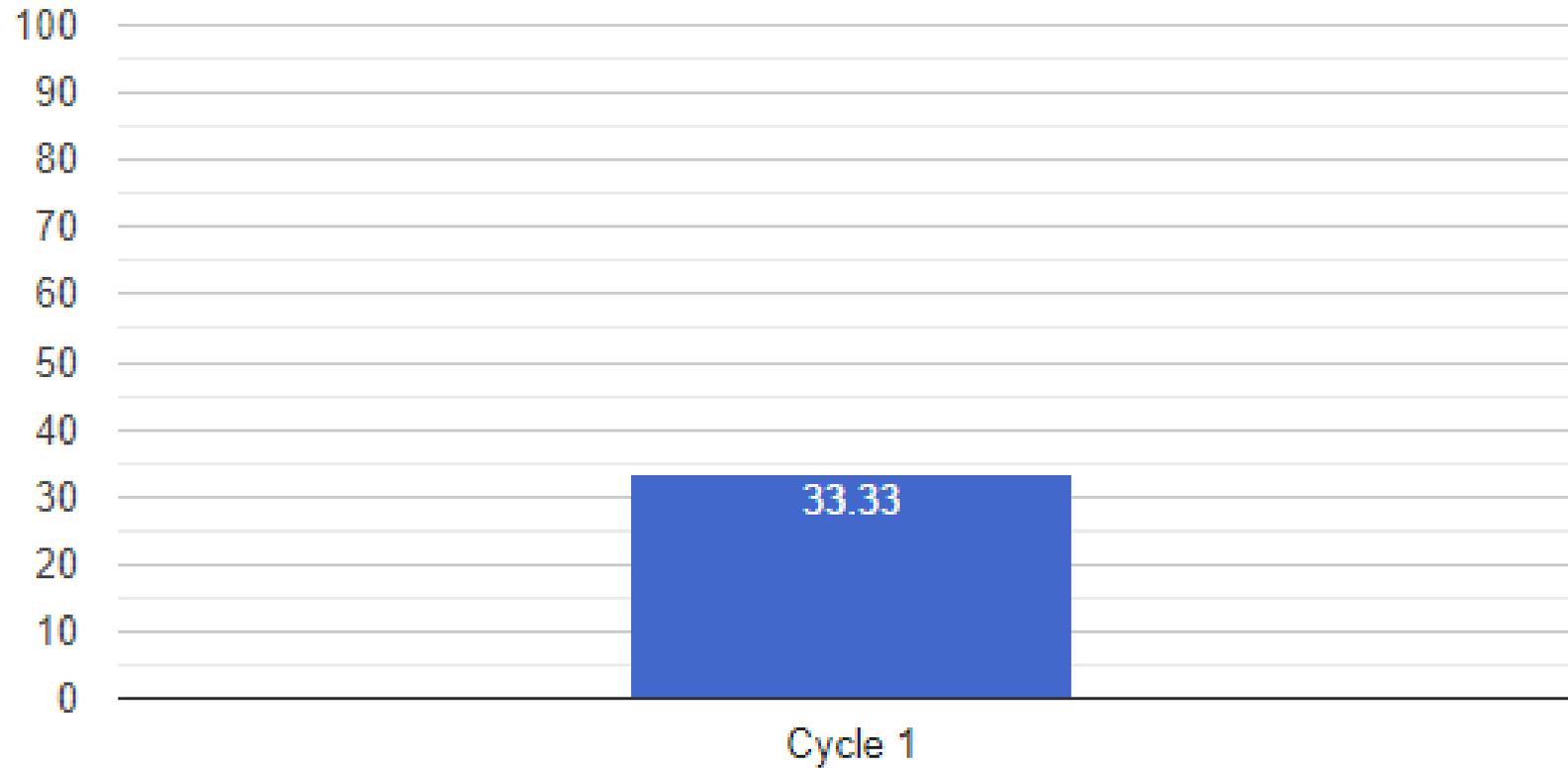
Care Management



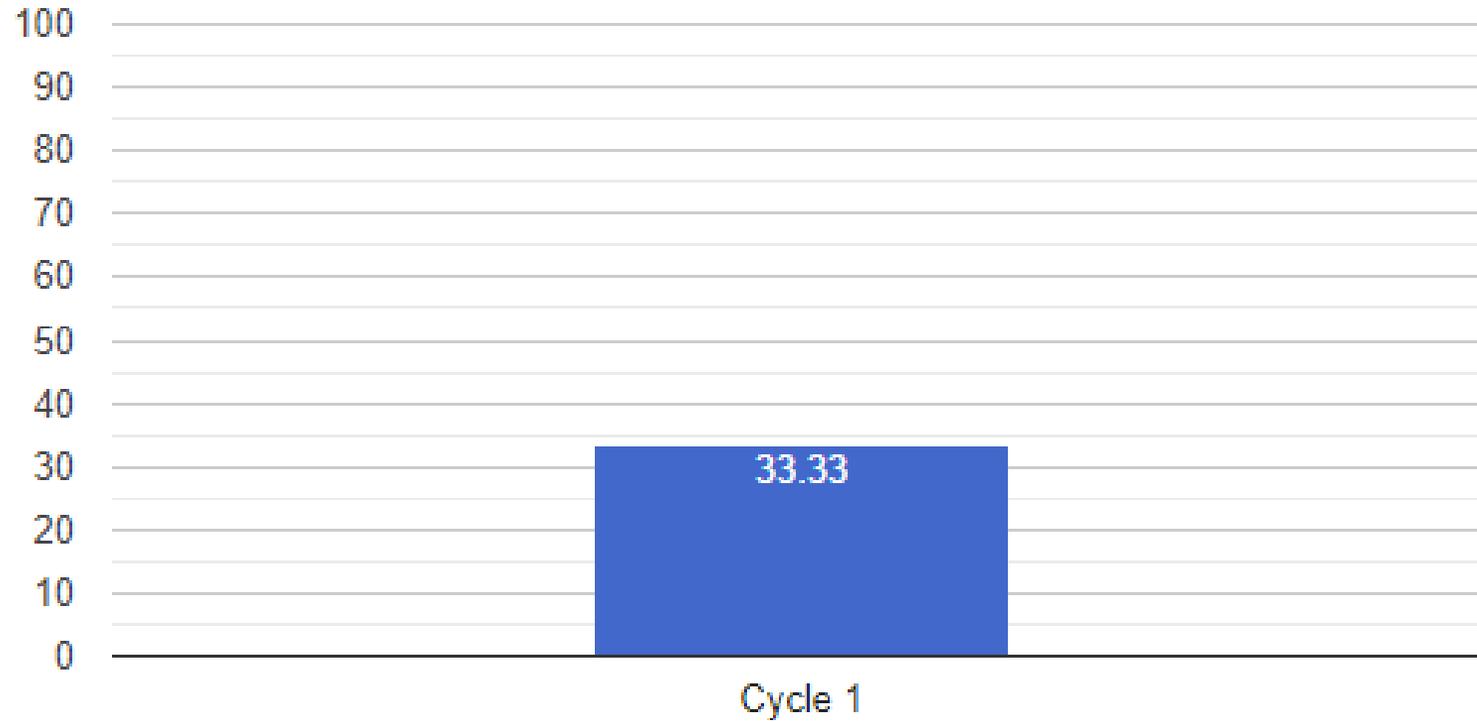
All Groups
Cycle 1 (N = 41)



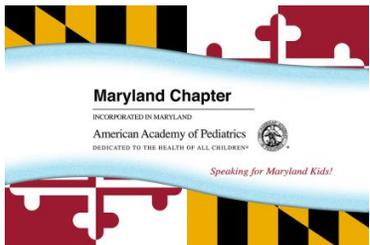
Counseling Parents



Referral to Academic programming



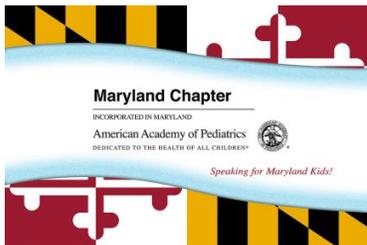
All Groups
Cycle 1 (N = 3)



PDSA WORKSHEET

AIM	<i>Describe the aim of this project. What are you trying to accomplish? Every aim will require multiple small tests of change.</i>						
IDEA	<i>Describe the proposed test. What performance gap will it address? What idea will you test? What barriers will you need to overcome?</i>						
	<table border="1"> <thead> <tr> <th data-bbox="491 401 1085 436">Performance gap</th> <th data-bbox="1085 401 1679 436">Idea for test</th> <th data-bbox="1679 401 2247 436">Barriers</th> </tr> </thead> <tbody> <tr> <td data-bbox="491 436 1085 544"></td> <td data-bbox="1085 436 1679 544"></td> <td data-bbox="1679 436 2247 544"></td> </tr> </tbody> </table>	Performance gap	Idea for test	Barriers			
Performance gap	Idea for test	Barriers					
MEASURES	<i>What is the desired goal that will close the performance gap? Describe the specific measures that will determine a successful outcome for the test.</i>						
PLAN	<i>Describe your plan for change. List the tasks and tools needed to perform the test. Predict what will happen when the test is carried out.</i>						
	<table border="1"> <thead> <tr> <th data-bbox="491 722 1679 758">Tasks and Tools</th> <th data-bbox="1679 722 2247 758">Predicted Outcome</th> </tr> </thead> <tbody> <tr> <td data-bbox="491 758 1679 1036"> Who: What: When: Where: How: Tools: </td> <td data-bbox="1679 758 2247 1036"></td> </tr> </tbody> </table>	Tasks and Tools	Predicted Outcome	Who: What: When: Where: How: Tools:			
Tasks and Tools	Predicted Outcome						
Who: What: When: Where: How: Tools:							
DO	<i>Try your change with a few patients over a short period of time. Collect data that can be measured. Describe what happened when you ran the test.</i>						
STUDY	<i>Did the change result in the desired improvement? Describe how the measured results compare to the predicted outcome.</i>						
ACT	<i>Describe how you will modify the plan in the next test cycle based on "learnings" from this cycle. Or, describe a new idea to test to help you achieve your aim.</i>						

QUESTIONS?



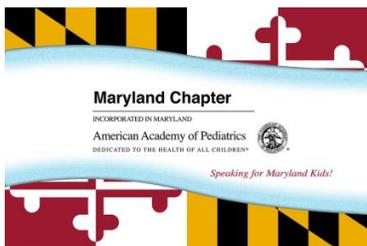
CASE PRESENTATION

- **CC:** Marvin is a three year, two-month-old male child returning for a follow-up visit due to an elevated blood lead level of 5 $\mu\text{g}/\text{dL}$, which he received at two years of age. Today, he received a follow-up blood level measure of 2 $\mu\text{g}/\text{dL}$.
- **Lead hazard risk assessment:** Marvin's family moved into this apartment (pictured right) five years before Marvin was born and live here currently. This property was constructed in 1910. Mom reported extensive house dust as well as chipping, flaking, and peeling paint in the property since they moved in. AAA LEAD Consultants completed a lead paint investigation of this property on August 16, 2019. Deteriorated lead-based paint was detected on numerous components in six interior rooms. Seven dust wipes were also over the limit. Water samples were below the threshold limit, but four soil samples exceeded threshold limits. An investigation of toys and personal items did not identify any additional lead-based paint hazards.



CASE PRESENTATION

- **Prenatal/Birth:** Marvin's mother was 39 years old during the pregnancy and she reported no complications and no gestational exposures. There were no excess fetal movements in utero. Marvin weighed 7.7 lbs. after a normal vaginal delivery and had an APGAR of 8 & 9 at one and five minutes. He was discharged after one day post-delivery, breast feeding well and with stable vital signs.
-
- **Personality/Behavior:** Parents report that Marvin exhibits hyperactivity and impulsivity that is worse when he is out in public. He has poor eye contact and "poor joint attention." He has sensory issues with loud noises, which make him upset. He has self-injurious behavior consisting of hitting his chin with objects.



CASE PRESENTATION

- **Family and Social History:** Marvin's mother is now 42 years old and in good health has no history of learning problems. His father is 47 years old and is in good health; he works as a gardener. Marvin has five older siblings, all in good health, with no history of elevated blood lead levels. Immediate family history is negative for ADHD, learning disorders, Autism Spectrum Disorder, psychiatric disorders, seizures, intellectual disabilities, neurodevelopmental disabilities, and genetic disorders.
- **General Health:** From birth through the age of 2 years, Marvin's length, weight, and head circumference were all in the appropriate range. However, at the 24-month well-child visit, he failed the M-CHAT (Modified Checklist for Autism in Toddlers). He has no history of TBI, seizures, or loss of consciousness.
- **General Physical and Neurological exam:** WNL.
- **Neurodevelopmental Assessment at this 3-year visit:** Visual-Motor Problem Skills were at the 18-month level, and Language Skills at the 16-month level. He was diagnosed with an Attention and Concentration Deficits based on the Conner Preschool Rating Scale, he had scores of 9/9 and 1/5 score for Oppositional Behavior.



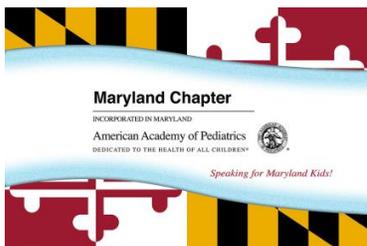
CASE DISCUSSION

- 1) Confirm property is lead safe.
- 2) Education of parents; refer to support group
- 3) Refer for interdisciplinary team evaluation including neuropsychological exam
- 4) Refer to *Child Find* for intervention
- 5) Monitor for anemia ¹
- 6) Monitor for increased risk for dental caries ²
- 7) Parent skills training for his disruptive behavior
- 8) Monitor for sleep disorders³

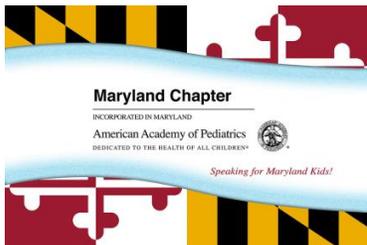
1. Hegazy A. Short report relation between anemia and blood lead levels of lead, copper, zinc, and iron among children. BMC Research Notes 2010 3:133.

2. Kumar KNP. Lead exposure and its relation to dental caries in children. Journal of Clinical Pediatric Dentistry. 2013. Vol. 38, No. 1 pp71-74.

3. Liu. L. Early blood lead levels and sleep disturbance in preadolescence. Sleep Vol 24 Number 12 2015

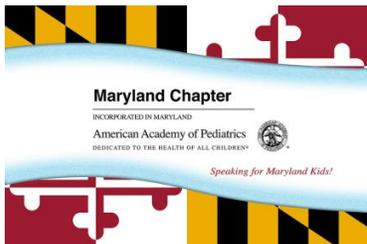


QUESTIONS?



FOLLOW UP AND NEXT STEPS

- You will receive a follow-up email from MDAAP with:
 - PPT slides from today and a recording of the session
 - Link to the post-session SurveyMonkey
- Next Steps:
 - Complete your PDSA form and return to troy_a_jacobs@hotmail.com and loretta@mdaap.org
 - Enter your data into QIDA
 - Next webinar/Didactic & QI Session #2 on Wednesday, November 2, 2022, at 12-1p ET



THANKS FOR TAKING CARE OF OUR MARYLAND KIDS!

