# Children at Risk:

## *Gaps in State Lead Screening Policies*

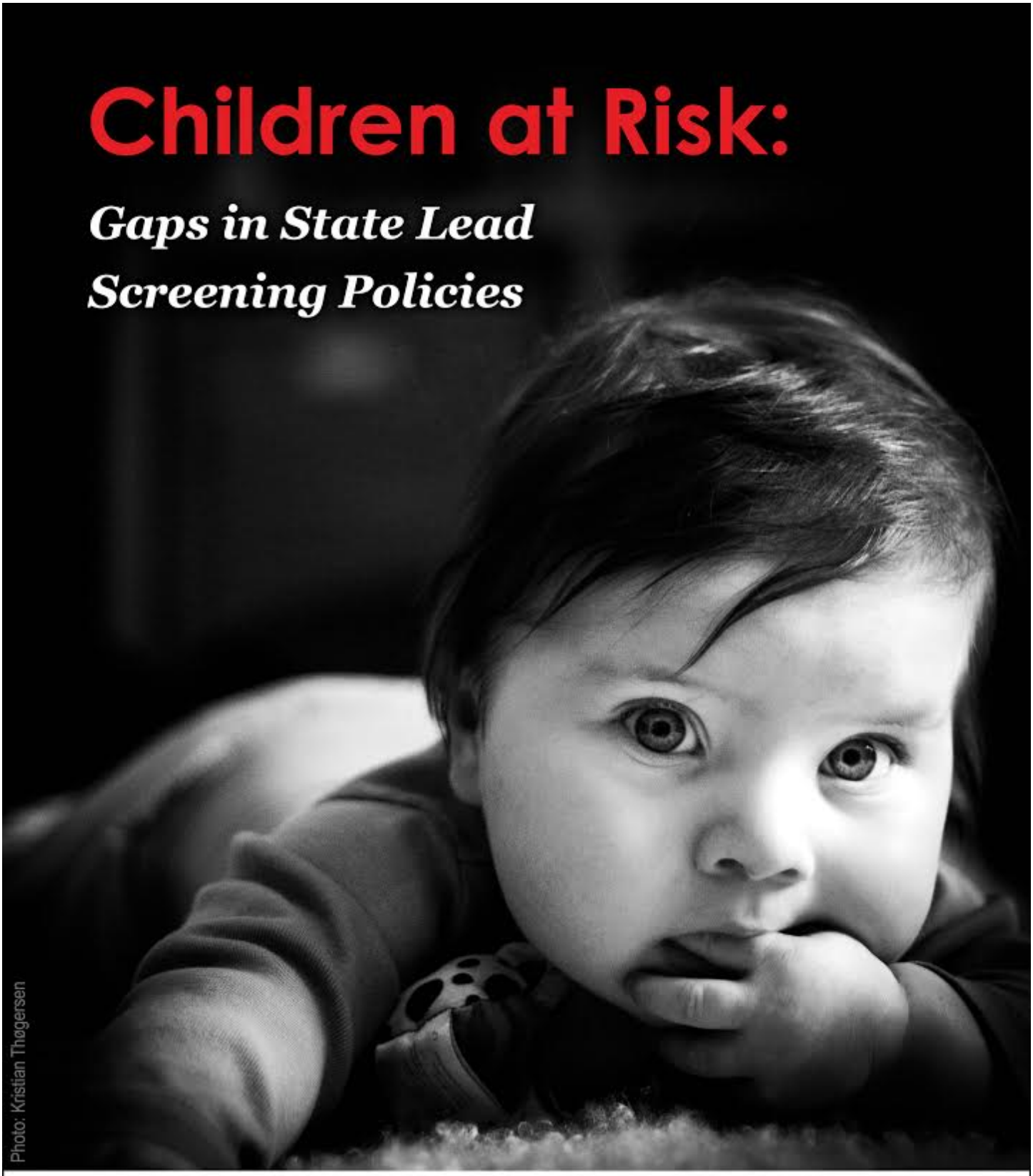


Photo: Kristian Thogersen

January 2017

Safer Chemicals Healthy Families

# Children at Risk:

## *Gaps in State Lead Screening Policies*


Written by:

Jennifer Dickman

Safer Chemicals, Healthy Families

January 2017

# Acknowledgements

The author thanks Andy Igrejas and Liz Hitchcock at Safer Chemicals, Healthy Families and Juliana Bilowich at Maryland PIRG for their review of the drafts, and for providing suggestions and insights. She is also grateful to colleagues Beth Kemler for formatting the print version of the draft and Amanda Frayer for creating the cover and formatting the HTML version of the draft.

Special thanks to the multitude of state and federal personnel who patiently provided comprehensive answers to our many questions, and to the National Committee for Quality Assurance for providing us with useful data on the lead screening measure in the Healthcare Effectiveness Data and Information Set. Additional thanks to Joshua Schneyer of Reuters who provided helpful insight on certain data sources and was willing to exchange information about this issue.

Safer Chemicals, Healthy Families bears responsibility for any factual errors. The views expressed in this report are those of Safer Chemicals, Healthy Families and do not necessarily reflect the views of our funders.

Safer Chemicals, Healthy Families (http://saferchemicals.org/) is a project of Kitchen Table Campaigns, a 501(c)(3) nonprofit organization. Safer Chemicals, Healthy Families is staffed by a seasoned group of organizers that is part of the Kitchen Table Campaigns team. We emphasize public education and strategies that blend traditional grassroots organizing with online communications, rapid response articles to new science and policy updates, and building coalitions that merge diverse organizations and businesses.

# Table of Contents



# List of Tables

# Executive Summary

There is no safe level of lead in a child's blood. Very young children are particularly vulnerable, even at low levels. While lead has been banned from household paint and gasoline for some time, there are numerous sources of exposure, including paint in older housing, water service lines and plumbing, and several continuing commercial uses. Primary prevention strategies that eliminate these sources are still the best way to prevent exposure to lead. Safer Chemicals, Healthy Families advocates for strong primary prevention policies (see saferchemicals.org for more information). Nevertheless, regular blood lead testing is critical for identifying very young children with elevated levels early enough that intervention can prevent or mitigate long-term developmental damage.

This report takes a detailed look at each state's blood lead testing policies. After comparing state programs by the percentage of children tested in recent years, the report discusses why some policies have been ineffective, and focuses on key reasons for higher testing rates reported in other states. The report concludes with a critique of targeted testing strategies and calls on states to move to universal screening to better protect their children.

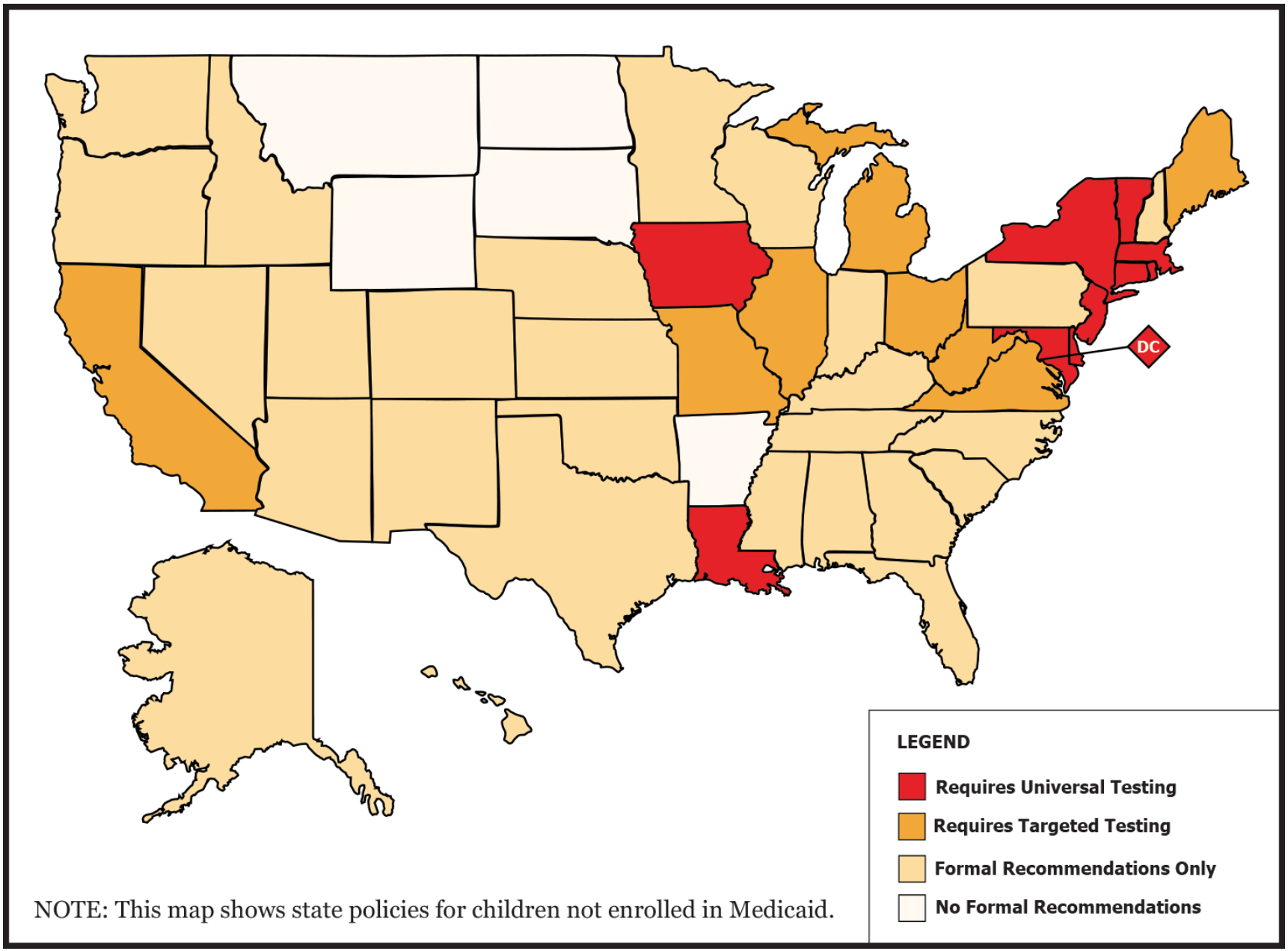
## Key Findings

1. The patchwork of blood lead screening policies is inadequate and likely misses a significant number of children with elevated lead levels during the critical window when intervention could prevent long-term damage.
2. State lead screening policies (non-Medicaid) span a range of possibilities:
    - 10 states plus D.C. require universal testing, generally for all children at ages 1 and 2;
    - 8 states require targeted testing;
    - 27 states only provide recommendations; and
    - 5 states have no requirements or recommendations on their websites.
3. 45 states plus the District of Columbia say clearly that they follow the federal requirement on testing for children enrolled in Medicaid.
4. While a few universal testing states come close, no state is 100% compliant with federal Medicaid requirements or general state policies that require testing children at the critically important ages of 1 and 2.
5. Several states have taken action to maximize testing rates. They require universal screening, educate providers and parents about the mandate, and make blood lead tests easier to obtain. Some require proof of a lead test for school enrollment.
6. Universal testing is more useful and cost-effective than targeted testing. Targeted testing strategies are unlikely to successfully identify all of the children at risk for lead exposure.

## Recommendations for States

1. Adopt universal testing to discover the full extent of blood lead levels above the federal reference level of 5 micrograms per deciliter.
2. Implement strategic education campaigns for health care providers and parents.
3. Make the testing accessible and affordable.
4. Require universal reporting of test results.
5. Publish data on tests done at both 12 and 24 months.

# State Lead Testing Policies



# Methodology

The information in this report is the product of extensive research on state and federal websites and numerous phone calls and emails with state and federal staff to clarify ambiguities. The research was primarily conducted in May and June of 2016, with information updated into October 2016 where possible. For many of the states, Safer Chemicals, Healthy Families (SCHF) interviewed staff in both the state lead poisoning prevention program and state Medicaid agency. To determine whether states required proof of a lead test for enrollment in a school or program (other than Head Start), and whether state laws required private insurance to cover the cost of a test, SCHF generally relied on statements by state lead poisoning prevention programs.

This report does not discuss states' primary prevention programs, such as for lead abatement, or talk about states' policies for following up on cases of children found to have elevated lead levels. Both of these are critical components of strategies to address lead poisoning.

## Reporting Requirements and Data for Tables 1.A - 1.D

For each state, Tables 1.A - 1.D list the type of blood lead testing requirements or recommendations and their test reporting requirements, and estimate their screening rates. In column D of Tables 1.A and 1.B and column B of Tables 1.C and 1.D, "All" means that the state requires all laboratories and at least all health care providers using point-of-care analyzers to report test results to the state.[1]

Three different types of sources can be used for the number of children reported to be tested for lead in a state on an annual basis. Most states provide their own data, and the Centers for Disease Control and Prevention (CDC) maintains two databases housing state data. One is part of the agency's lead program, which processes raw state data and displays it in the National Surveillance Data spreadsheet accessed via http://www.cdc.gov/nceh/lead/data/national.htm.[2] The agency's Environmental Public Health Tracking Program (referenced here as "Tracking Program") also displays childhood lead poisoning data, which CDC takes directly from the states that provide it and posts without running the data through any screens.[3] If states do not provide data, the Tracking Program uses National Surveillance Data. In addition to the level of processing, the two CDC databases differ in the type of data shown. The Tracking Program provides annual numbers and percentages for children given a lead test in the age groupings (a) birth to under 36 months and (b) 36 months to under 72 months. The National Surveillance Data displays the total number of children tested under 72 months only.

The critical ages to identify children with lead poisoning are around 1 and 2. The Tracking Program's data on the percentage of children tested under 36 months provides a better approximation of how many children were tested close to these critical ages than the data on children tested under 72 months. Therefore, SCHF gathered the most recent and complete percentages for 28 states plus the District of Columbia from this database, and displayed it in the columns entitled "% of kids <36 mo. tested" (column E in Tables 1.A and 1.B; column C in Tables 1.C and 1.D). The numbers are from 2014 except where noted. Data on this measure for two states were taken directly from state reports.[4]

We also display the percentages of children tested under 72 months in the tables below (column F in Tables 1.A, 1.B, and column D in Tables 1.C, 1.D). Most states display their data in this grouping. In addition, one state (Iowa) requires children to have one lead test by age 6 (or as soon as possible after) on enrollment to kindergarten.

Data for 33 states plus DC on the number of children tested under 72 months were taken from the most recent and complete numbers in the

National Surveillance Data spreadsheet; that data is from 2015 except where noted. We divided the number of children under 72 months old that were reported screened by the total population under 72 months listed there.

We did not find reliable data on this measure (<72 mo.) for seven states in either of the CDC databases, so our analysis for those relied on recent state reports.[5] The total population of children younger than 72 months was not available from two of the state reports, so we used 2010 Census data.[6] Nine states did not have complete data that was more recent than 2010 on CDC's databases or in state reports; seven of these do not require all results to be reported.

No state requires tests for children every year from birth to age 3 or to age 6, so a 100% testing rate is not expected. The percentages of children tested at younger than 36 months are higher than those for all children under 72 months because most of the lead tests from birth to 6 years of age happen around ages 1 and 2.

The states are ordered by the percentage of children tested under 36 months where available, then by the percentage of children tested under 72 months, and then alphabetically.

The data in column G of Table 1.A, "% of kids tested in target age range," are from state reports or correspondence with state staff. These percentages compare the number of tests reported in universal testing states to the states' testing requirements, and in some cases look at the percentage of children tested by only one of the required ages.

The policies described in Tables 1.A - 1.D are current state policies that were generally in effect during the years for which the screening data was reported. Two notable exceptions are Maryland and Washington State, which adopted new testing programs after their data was reported.

In this report, because inconsistencies and other concerns with the available data make it impossible to develop a true ranking, we intentionally avoid ranking one state's program against another, and instead only seek to compare the different aspects of the programs and the available results.

## Data for Table 2

The percentages in bold are official benchmarks from the Healthcare Effectiveness Data and Information Set (HEDIS®) Medicaid measure of "Lead Screening in Children," from the National Committee for Quality Assurance's (NCQA) Quality Compass® 2015 edition.[7] These represent the number of children in 2014 who received at least one blood lead test by age 2, divided by the number of children enrolled in Medicaid for at least 12 months before their second birthday. The benchmarks are from the states with at least five Medicaid plans reporting on this measure. Note that the numbers may not reflect all Medicaid plans in a given state since all may not report to NCQA. For states without NCQA benchmarks (non-bold text), SCHF averaged individual plan rates provided by NCQA.

The benchmarks and rates derived from NCQA data do not show how many children received two tests by age 2 as required by the Centers for Medicare and Medicaid Services. In addition, because all Medicaid plans in a particular state may not report, these data may not accurately reflect the actual percentage of children with at least one test by age 2.[8]

# I. Introduction

## Background on Lead

Lead is a metal that naturally occurs in the Earth's crust. For centuries, lead was added to paint as a pigment, and was used in water pipes, fixtures, and solder. It was first added to gasoline to improve octane ratings in the 1920s. After scientists realized the harms posed by lead, especially for children and their development, the substance was successively taken out of new household paint, automobile gasoline, and new plumbing in the U.S.[9]

Today, the paint in older housing can be hazardous to young children, especially if the paint is in disrepair. From the most recent national estimate, in 2005-2006, out of the 37 million homes with lead-based paint (35% of homes in the U.S.), 34 million were built before 1978 and 23 million had hazards such as deteriorating paint or lead in the dust or surrounding soil at levels above federal thresholds.[10] Children under 6 lived in 3.6 million of the homes with lead-based paint hazards.[11] Soil can contain high levels of lead, a legacy from exterior leaded paint, leaded gasoline, and industrial sources. The Flint crisis has shown the danger of lead pipes when the water flowing through them is corrosive. One study found that children exposed to lead in dust, water, and soil were associated with having 36%, 20%, and 11-16% higher blood lead levels (BLLs), respectively, than those not exposed.[12]

Large quantities of lead can be extremely dangerous for children and adults, leading to kidney damage and brain damage. Even the smaller amounts found in soil or household dust from deteriorated paint may still be harmful, without symptoms that are immediately apparent.[13] There is no safe amount of exposure or safe level of lead in a child's blood.[14] Low levels have been strongly associated with "intellectual deficits, diminished academic abilities, attention deficits, and problem behaviors."[15]

It's important to act quickly to measure BLLs after suspected exposure. Once lead enters the body, it travels to soft tissues and different organs via the blood, and most of it moves into the bones and teeth in a matter of weeks, where it can stay for decades. The rest is excreted. "About 73% of the lead in children's blood is stored in their bones."[16] When the lead exposure happens over a shorter timeframe, elevated levels in the blood "will decline within a few weeks to months," but if exposure happens over an extended period of time, "the decline in BLL can take much longer."[17] Catching elevated blood lead levels (EBLLs) early through regular blood testing can help prevent further adverse impacts once the source of lead is addressed and can provide an opportunity for interventions that may mitigate the impacts, although it is much better to prevent the exposure to lead in the first place.[18]

"Catching elevated blood lead levels (EBLLs) early through regular blood testing can help prevent further adverse impacts … although it is much better to prevent the exposure to lead in the first place."

Generally, studies have shown that BLLs start to increase "in late infancy" and peak at 18-36 months.[19] This is because of "normal mouthing behaviors and increasing mobility," as well as the fact that lead is absorbed more efficiently by younger children.[20] Routine testing timeframes of around ages 1 and 2 are based on this BLL trend.

# II. Federal Testing Policies and Funding

## Recommendations by the Centers for Disease Control and Prevention

Screening recommendations by the Centers for Disease Control and Prevention (CDC) have changed over time. In 1978, CDC recommended universal screening for all children from 9 months to 6 years, with a special emphasis on screening by risk factors such as living in poorly maintained housing.[21]

By 1997, CDC recognized that outside the Medicaid population, fewer children had EBLLs and the risk for lead exposure varied depending on geographic location. In light of this, CDC recommended states look at local BLL data and risk patterns to develop targeted screening strategies for children at ages 1 and 2 (and from 36-72 months if not previously screened) to better identify children with elevated lead levels.[22] Universal screening was recommended by the agency only for communities where at least 12% of the children had elevated lead levels or where at least 27% of the housing stock was built before 1950.[23]

In 2012, CDC began using a "reference value" for blood lead concentrations to identify children with lead exposure.[24] The level is currently 5 micrograms per deciliter (µg/dL), and is higher than the BLL of 97.5% of children aged 1 to 5 in the U.S. who were tested for lead. The reference value can be used to trigger follow-up testing and other actions like environmental investigations, and to target primary prevention efforts.[25]

Previously, CDC had issued recommendations for various "levels of concern" to indicate EBLLs needing intervention; from 1991 to 2012, the level of concern was 10 µg/dL.[26]

## Medicaid Requirements

The Centers for Medicare & Medicaid Services (CMS) is the federal agency that administers Medicaid. CMS requires children receiving Medicaid's Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) benefit to be tested for BLLs at 12 and 24 months, and between the ages of 36 months and 72 months if the children were not previously tested.[27] There were no exceptions to this until 2012, when CMS aligned its position with 2009 CDC recommendations and began allowing states to request approval to conduct targeted testing of children enrolled in Medicaid if they could provide data showing that it would be more effective in identifying children with high BLLs.[28]

CDC does not have authority to require any blood lead testing; the agency can only make recommendations on the topic. In 2009, CDC determined that the number of children with EBLLs had decreased over the years. The agency found that national data and state-level studies suggested this decrease was similar for Medicaid-enrolled children and for the general population.[29] They concluded that Medicaid eligibility did not necessarily mean the child faced an increased risk for EBLLs. CDC also believed that state officials were better equipped to identify the risk factors most impacting BLLs in their states. In agreeing with CDC's recommendation for data-driven targeted screening of Medicaid-enrolled children, CMS emphasized that states would be able to use their limited resources for the children most in need of screening.[30]

In its June 2012 memorandum, CMS noted the importance of primary prevention to avoid exposure to lead in the first place, but lauded screening as "critically important for identifying

children with elevated blood [lead] levels and referring them for" follow-up care.[31]

According to CMS staff, CMS has authorized only Arizona to conduct targeted screening of Medicaid-enrolled children.[32] At least a few more states – Washington state and Nevada – have applications pending for targeted testing.[33] In the wake of the Flint crisis, the CMS targeted testing option has come under Congressional scrutiny.[34]

## CDC Funding of State Programs

In 2003, CDC required state health departments that it funded "to develop and implement strategic childhood lead poisoning elimination plans."[35] In Fiscal Year (FY) 2011, CDC's program budget was around $30 million and it was able to give large grants to bolster strong state lead programs – the average state or city grant was around $500,000.[36] However, CDC funding for state lead programs was sharply cut in FY2012 and FY2013. $11 million in grant funding, out of the program's $15.5 million budget, became available in FY2014 and was awarded to 29 states, DC, and 5 cities.[37] These programs have received an average award of between $250,000-$300,000/year, contingent on the availability of future funds, in 3-year cooperative agreements that end in August 2017.[38]

# III. State Lead Screening Policies and Reporting Requirements

The stronger a state's policy on testing and reporting, the more likely it is to have a higher number of children tested in a given year, and to find more children with EBLLs. Tables 1.A – 1.D, using the most recent available data, estimate states' screening rates and match them with lead testing policies to provide context.[39] Tables 1.A and 1.B show which states require proof that a child had received a lead test when enrolling in childcare, preschool, kindergarten, or as late as first grade.[40] Additionally, these tables note whether a state has a law or regulation requiring insurance companies to cover lead tests. Other best practices are discussed below in Section V.

Reporting requirements are also provided because this may explain some lower testing rates. When laboratories or providers' offices are not required to report the results of all lead tests, the screening rate may be artificially lowered.

The percentages shown in Tables 1.A - 1.D in the column entitled "% of kids < 36 mo. tested" reflect the number of children under 36 months old (3 years) who were reported as tested in a recent year out of the total population of children under 36 months. Children are much more likely to be tested – and should be tested – around ages 1 and 2, so this data from the CDC's Environmental Public Health Tracking Program (Tracking Program) gives a better idea of how states are doing on testing children closer to these critical ages. We also provide data in the age grouping of "under 72 months" because CDC has historically recommended a test up to 72 months if the child wasn't tested earlier. It captures more of the tests that are completed. The National Surveillance Data on CDC's lead page reflects this grouping, as do data from most states.

Most universal testing states also provided the screening rate of at least one age group of the population they required to be screened. Those percentages are in Table 1.A., in column G labeled "% of kids tested in target age range" and are explained in the footnotes below the table.

# Table 1.A – States With Universal Childhood Lead Testing Policies

| State | A. Application of policy | B. Requires proof of lead test for non-Head Start program, school? | C. State law requires insurance to cover testing, separate from ACA coverage? [A] | D. Reporting req. for kids < 72 mo. | E. % of kids < 36 mo. tested (2014 unless noted) | F. % of kids < 72 mo. tested (2015 unless noted) | G. % of kids tested in target age range [B] |
|---|---|---|---|---|---|---|---|
| **MA** | Univ. (between 9 and 12 mo., at 2 y. & 3 y.) | Kindergarten | All policies | All | 58% | 47% | 76% |
| **VT** | Univ. (at 12 and 24 mo.) | | No; insurance covers all or most | All | 52% (2012) | 27% | 80%, 68% |
| **RI** | Univ. (between 9-15 mo., 21-27 mo.) | Public/private child care facilities, early childhood education programs, pre-K, kindergarten | All non-supplemental policies | All | 50% | 40% | 55%, 78% |
| **CT** | Univ. (annually 9 through 35 mo.) | 2 Local Health Departments: both kindergarten, one also pre-K | Most broad individual and group policies | All [C] | 50% | 30% | 53%, 97% |
| **DC** | Univ. (between 6-14 mo., 22-26 mo.) | Daycare, early childhood programs, pre-K, kindergarten, first grade | | All | 44% | 34% (2014) | 31%, 91% |

| State | A. Application of policy | B. Requires proof of lead test for non-Head Start program, school? | C. State law requires insurance to cover testing, separate from ACA coverage? [A] | D. Reporting req. for kids < 72 mo. | E. % of kids < 36 mo. tested (2014 unless noted) | F. % of kids < 72 mo. tested (2015 unless noted) | G. % of kids tested in target age range [B] |
|---|---|---|---|---|---|---|---|
| **IA** | Univ. (children seeking to enter kindergarten, by 6 y. or right after) | Kindergarten | | All | 39% (2013) | 26%[D] | 82%, 100.5% |
| **NY** | Univ. (at or around 1 y. and 2 y.) | Child care, nursery schools, pre-K | | All | 36% (2012) | 31%[E] | 56% |
| **MD** | For kids born in 2015 and after: Univ. (at 12 & 24 mo.), as of 2016 for 3 y.; For older kids: Required (targeted testing) | Child care facilities, public pre-K, kindergarten, first grade [F] | No; most reimburse | All | 36%[F] | 25%[F] | |
| **NJ** | Univ. (around 12 and 24 mo.) | | Group health policies | All | 35% (2013) | 28% | 75% |
| **LA** | Univ. (at 12 and 24 mo.) | | | All | 28%[G] | 18%[G, H] (2014) | |
| **DE** | Univ. (at or around 12 mo.) | Child care, nursery schools, pre-K, kindergarten | Most broad individual and group policies | All | Complete data not available after 2010[I] | 18% | |

# Table 1.B – States Requiring Targeted Childhood Lead Testing

(Separate from Medicaid testing policies)

| State | A. Notes on Policy | B. Requires proof of lead test for non-Head Start program, school? | C. State law requires insurance to cover testing separate from ACA coverage? [A] | D. Reporting req. for kids < 72 mo. | E. % of kids < 36 mo. tested (2014 unless noted) | F. % of kids < 72 mo. tested (2015 unless noted) |
|---|---|---|---|---|---|---|
| **MO** | Required (staff treats as recommendations) | Child care facilities in high risk areas | Broad individual and group policies | All | 38% (2013) [J] | 18% |
| **IL** | Required | Childcare facilities, (defined as daycare, nursery school, pre-K, kindergarten), per state testing requirement | | All | 31% [K] | 27% [H] (2014) |
| **MI** | Required (WIC only) | | | All | 29% | 19% |
| **ME** | Required (Website implies rec. outside Medicaid) | | | All | 29% (2013) | 17% (2011) |
| **OH** | Required | | | All | 28% | 18% (2014) |
| **VA** | Required | | Staff has never heard of insurance not covering | All (Since Oct. 2016) [L] | 21% (2011) | 16% (2011) |
| **CA [M]** | Required | | Group policies | All | Not available | 19% (2011) |
| **WV** | Required (staff treats as recommendations) | | | All | Complete data not available [N] | 8% |

# Table 1.C – States with Formal (Written) Childhood Lead Testing Recommendations

(Separate from Medicaid testing policies)

| State | A. Notes on Policy | B. Reporting req. for kids < 72 mo. | C. % of kids < 36 mo. tested (2014 unless noted) | D. % of kids < 72 mo. tested (2015 unless noted) |
|---|---|---|---|---|
| **WI** | Recommended | All | 34% | 21% |
| **NH** | Recommended (may require after 2017) | All | 31% | 17% |
| **TN** | Recommended | All | 28% | 17% |
| **PA** | Recommended (limited) | Labs: all; Providers: lead poisoning [O] | 27% | 16% (2014) |
| **MS** | Recommended | All | 23% | 18% |
| **GA** | Recommended; but screening plan says "necessary" to test on risk | All | 23% | 12% |
| **FL** | Recommended | All | 19% (2012) | 14% (2012) |
| **OK** | Recommended [P] | All | 19% | 13% |
| **KS** | Recommended (currently no funding for program) | All | 17% (2011) | 14% (2011) |

| State | A. Notes on Policy | B. Reporting req. for kids < 72 mo. | C. % of kids < 36 mo. tested (2014 unless noted) | D. % of kids < 72 mo. tested (2015 unless noted) |
|---|---|---|---|---|
| **SC** | Recommended | All | 14% (2013) | 9%[Q] (2013) |
| **AZ** | Recommended | All | 13% | 9% |
| **IN** | Recommended; but screening plan says "necessary" to test | All | 12% | 8% (2014) |
| **CO** | Recommended | All | 7% | 4% (2014) |
| **KY** | Recommended | Labs & Providers: ≥ 2.3 µg/dL | 6% | 4% |
| **OR** | Recommended | All | 6% | 4% |
| **MN** | Recommended (note: screening plan modeled after WI) | All | Not available | 21% |
| **NE** | Recommended | All | Not available | 20%[H] |
| **NC** | Recommended | All | Not available | 19% (2014) |
| **TX** | Recommended | All | Complete data not available | 18%[H] (2011) |
| **NM** | Recommended | All | Not available | 7% |

| State | A. Notes on Policy | B. Reporting req. for kids < 72 mo. | C. % of kids < 36 mo. tested (2014 unless noted) | D. % of kids < 72 mo. tested (2015 unless noted) |
|---|---|---|---|---|
| **WA** | Recommended (as of 2016) | All | Not available | 3% (2012) |
| **AK** | Recommended | Labs: all; Providers: ≥ 5 µg/dL | Not available | 1%[H] (2012) |
| **AL** | Recommended | Providers: ≥ 10 µg/dL | Complete data not available | Complete data not available |
| **HI** | Recommended (no funding for program) | Labs & Providers: ≥ 5 µg/dL, acc. to staff | Not available | Not available |
| **ID** | Recommended | Labs & Providers: ≥ 5 µg/dL | Not available | Not available |
| **NV** | Recommended (acc. to law; no funding for statewide program and no website) | In one county: Labs & Providers report "exposures & elevated levels" [R] | Not available | Not available after 2010 |
| **UT** | Recommended | All | Complete data not available [S] | Complete data not available [S] |

# Table 1.D – States With No Formal Childhood Lead Testing Policy

(Separate from Medicaid testing policies)

| State | A. Notes on Policy | B. Reporting req. for kids < 72 mo. | C. % of kids < 36 mo. tested (2014 unless noted) | D. % of kids < 72 mo. tested (2015 unless noted) |
|---|---|---|---|---|
| **WY** | Recommended (verbal; no federal funding for program) | All | Not available | 5%[H] |
| **AR** | Recommended (verbal; not on website) | Labs & Providers: > 5 µg/dL | Not available | Not available |
| **MT** | No testing policy [T] | All | Not available | Not available |
| **ND** | Recommended (verbal; not clear on website) | Labs & Providers: ≥ 10 µg/dL | Not available | Not available |
| **SD** | No rec. from state on website; lead program being developed | Labs & Providers: ≥ 5 µg/dL to state (Since Jan. 2016) | Not available | Not available |

## Notes for Tables 1.A, 1.B., 1.C, and 1.D

***A*** – See Section V.; "Covering the Cost of Lead Testing," for more details on Affordable Care Act coverage of lead tests.

***B*** –

*MA*: 76% is the percentage of children 9 months to 47 months who were tested in 2015, shown here because Massachusetts requires tests around age 1 and at ages 2 and 3. Massachusetts Childhood Lead Poisoning Prevention Program, "Screening and Prevalence of Childhood Blood Lead Levels for Children 9 months to less than 4 years of age by Community, Calendar Year 2015," p. 24, August 25, 2016, http://www.mass.gov/eohhs/docs/dph/environmental/lead/stats/screening-and-prevalence-statistics-by-community-cy-2015.pdf

*VT*: 80% of children aged 1 and 68% of children aged 2 were tested for lead in 2015. These percentages reflect only one test per child by age, but may include more than one test per child for the reporting year. Chen MD, Harry, "Lead Poisoning Prevention: Report on 2015 Program Outcomes and Activities," April 15, 2016, p. 6, http://legislature.vermont.gov/assets/Legislative-Reports/Lead-Poisoning-Prevention-4.15.16.pdf

*RI*: Out of children who turned 36 months in 2015, 55% had been tested twice at least 12 months apart and 78% of those children received at least one test by 18 months. Kollett-Almeida, Michelle et al., "CDC Site Visit, June 2016," Rhode Island Department of Health, p. 23.

*CT*: Out of children born in 2011, 53% were tested around ages 1 and 2 and 97% were tested at least once through 35 months of age. State of Connecticut Department of Public Health, "2014 Annual Disease Surveillance Report," June 9, 2016, p. 9, http://www.ct.gov/dph/lib/dph/environmental_health/lead/pdf/2014_Annual_Lead_Surveillance_Report_Final.pdf

*DC*: By July 1, 2015, 31% of children 24 to 35 months old were reported to have received lead tests in both of the statutorily required age ranges and 91% had been tested at least once in their lifetimes. Both pieces of data were obtained via email on July 18, 2016 from staff in the Lead and Healthy Housing Division of the District of Columbia Department of Energy and Environment. DC staff preferred this data, but the 34% is shown in the chart for ease of comparison with other states.

*IA*: 82% is the percentage of children born in 2012 and tested up to age 3. 100.5 % is the percentage of children born in 2009 and tested before age 6, per state law. One explanation for a percentage over 100 is that children moved into the state after 2009, so there were more children to be tested than the number born in 2009. Also, staff mentioned that they recently combined a large number of databases into one, and a small amount of duplication still exists. Iowa Department of Public Health, Iowa Public Health Tracking Portal, "Birth Cohort Children Under 6 > State Measures," Retrieved on October 24, 2016, https://pht.idph.state.ia.us/Dashboards/Dashboards/Birth%20Cohort%20Children%20Under%206/State%20Measures.aspx; Iowa Department of Public Health, Iowa Public Health Tracking Portal, "Birth Cohort Children Under 3 > State Measures," Retrieved on October 24, 2016, https://pht.idph.state.ia.us/Dashboards/Dashboards/Birth%20Cohort%20Children%20Under%203/State%20Measures.aspx; Iowa Department of Public Health staff, Personal Communication, July 7, 2016

*NY*: 56% of children born in 2011 received at least two lead tests by 36 months. New York State Department of Health, "Percentage of children born in 2011 with at least two lead screenings by 36 months," Revised August 2016, https://www.health.ny.gov/statistics/chac/general/g27.htm

*NJ*: 75% of children who turned three during the period July 2013 to June 2014 had at least one lead test. New Jersey Department of Health, "Childhood Lead Poisoning in New Jersey Annual Report, Fiscal Year 2014," p. 9, http://www.nj.gov/health/fhs/documents/childhoodlead2014.pdf

***C*** – Staff in the Connecticut Department of Public Health specifically stated that regulatory action can be taken against the license of a laboratory if a laboratory refuses to report in line with the state's reporting law. Connecticut Department of Public Health, Personal communication, July 22, 2016

***D*** – The percentage of Iowa children under 72 months who were tested for lead in 2015 is taken from the state's data portal as opposed to CDC's National Surveillance Data table. That table only had complete data for Iowa as recent as 2011 (32%). Iowa's data portal shows a similar percentage of children (31%) tested in 2011, but the rest of the state's data shows a decline into 2015. Iowa Department of Public Health, Iowa Public Health Tracking Portal, "Annual Testing Children Under 6 > State Measures," Retrieved on October 27, 2016, https://pht.idph.state.ia.us/Dashboards/Dashboards/Annual%20Testing%20Children%20Under%206/State%20Measures.aspx

***E*** – Safer Chemicals, Healthy Families (SCHF) found that on CDC's National Surveillance Data table, the 2010 population of the row labeled "New York (Excl. NYC)" appears to include all of New York State based on comparisons to 2010 Census data. We assumed that this was the case for the other years of population data and that all of the screening numbers for "New York (Excl. NYC)" and "New York City" were properly labeled. Therefore, this percentage was calculated by adding the screening numbers from both of those categories but only using the population in the row labeled "New York (Excl. NYC)" for the denominator.

***F*** – The testing rates are from 2014 and 2015, respectively for columns E and F, before the state instituted universal testing in 2016.

Also, in Maryland, parents are only required to provide proof of a lead test to enroll their child in the programs listed in column B where the child currently lives or previously lived in an "at-risk" area. The state defines this as all areas of the state for children born in and after 2015, but only specific at-risk zip codes for those born before 2015.

***G*** – The percentages in columns E and F do not reflect any children who were tested between birth and 6 months. The percentage in column F may reflect children tested at 72 months.

Additionally, the numerator for the percentage in column E was taken from the 2014 state report because CDC's Environmental Public Health Tracking Program (Tracking Program) currently does not display Louisiana data for 2014. The denominator is from 2010 Census population data. To obtain the population of children aged 6 mo. through 11 mo., because screening numbers were not provided for children from birth to 6 months, we divided the census population for children under age 1 in half. Huynh, Ngoc, "Louisiana Healthy Homes and Lead Poisoning Surveillance System Report, 2014," November 20, 2015, p. 0, http://www.dhh.louisiana.gov/assets/oph/Center-PHCH/Center-PH/genetic/LEAD/SurvellianceData/DHHLeadSurveillanceReport2014.pdf

***H*** – The percentages of children tested under 72 months were taken from publicly available state reports for these states because CDC data was not complete or available: Alaska, Illinois, Louisiana, Nebraska, and Texas. Wyoming's data was provided directly to SCHF by staff. Iowa's data also comes from a state report but for different reasons than these states, so it is discussed in note D above.

***I*** – The Tracking Program does display the percentage of Delaware children reported to be tested for lead under 36 months in 2011. However, the annual number of children tested used to derive that percentage was not consistent with either National Surveillance Data or state data for 2011, so it is not shown here.

***J*** –Missouri Department of Health and Senior Services staff confirmed via email message on November 1, 2016 that 2013 was the most recent and complete year for annual numbers of Missouri children tested under 36 months in the Tracking Program's portal. Accordingly, the table shows the percentage from 2013.

***K*** – This percentage was taken from the 2014 Illinois state surveillance report rather than the Tracking Program data because the annual testing numbers in this portal, on which the percentages are based, looked consistent with CDC National Surveillance Data that was labeled incomplete.

***L*** – Virginia's reporting requirements were amended effective October 20, 2016 to require laboratories and doctors to report all detectable BLLs in children under 15; previously only levels at 10 µg/dL and above were required to be reported. 33:2 VA.R. September 19, 2016; 12VAC5-90, http://register.dls.virginia.gov/details.aspx?id=5917

***M*** - Staff in the California Department of Public Health mentioned by email on July 21, 2016 that the Report of Health Examination required for entry into first grade has a space for the result of a blood lead test, but said it wasn't a "specific requirement."

***N*** – The Tracking Program does provide the percentage of West Virginia children under 36 months reported to be tested for lead in 2011 through 2014. The annual numbers of children tested used to derive that percentage were consistent with the state's data, but not with National Surveillance Data. Staff in the state's Office of Maternal, Child and Family Health could not explain the difference between state data and National Surveillance Data due to recent staff turnover, and we considered the National Surveillance Data to be more reliable since CDC had put it through various screens. Therefore, we do not display the Tracking Program data for West Virginia.

***O*** – Pennsylvania defines "lead poisoning" as a result of ≥ 20 µg/dL, or 2 or more venous levels of 15-19 µg/dL (inclusive) at least 3 months apart. 27 Pa. Code § 34(b)

***P*** – Oklahoma State Department of Health staff said over a few phone conversations that the state requires universal testing of all children aged 12 and 24 months, and they tell this to doctors, but the rules do not clearly reflect that. The state tells providers the testing is required but most only end up testing children living in the high-risk zip codes that are actually meant to determine who needs additional testing before or after 12 or 24 months of age. Oklahoma State Department of Health staff, Telephone interviews, late May 2016, June 30, 2016, August 5, 2016

***Q*** – Since the National Surveillance Data table did not show numbers for South Carolina, the percentage in column D reflects data from CDC's Tracking Program, relative to 2010 census data.

***R*** –In terms of a statewide reporting requirement, NRS 442.700, 3 states: "Each qualified laboratory that conducts a blood test for the presence of lead in a child who is under 18 years of age shall . . . submit a report of the results of the test to the appropriate health authority *in accordance with regulations adopted by the State Board of Health*" (emphasis added). However, staff with the Nevada Department of Health and Human Services, Division of Public and Behavioral Health stated by email on August 31, 2016 that they were not aware of any such regulations, indicating that this is an empty requirement.

***S*** – Utah did provide data on its website, and the CDC's Tracking Program also contained data for Utah. However, Utah has only required universal reporting since 2015; prior to that time, Utah required only results at or above 10 µg/dL to be reported. The website states that despite the limited previous requirement, most labs reported all results except for one large lab, which only reported as required. Since data from 2014 and earlier would not provide anywhere near a complete picture of the testing actually done in the state, the percentages are not provided here. Utah Admin. Code r. 386-703-3(1)(h); Utah Department of Health, Environmental Public Health Tracking, "Query Results for Query Module for Blood Lead Levels by County," see under "Data Notes," http://epht.health.utah.gov/epht-view/query/result/bll/BLLMain/Count.html.

***T*** – Although SCHF found a 2012 Montana Public Health document with testing recommendations, this was not posted on what appeared to be the current Montana Lead Poisoning Prevention website. This website did not have any state recommendations and staff did not respond to questions about the current recommendations. Montana DPHHS, "Lead Poisoning Prevention," accessed October 24, 2016, http://dphhs.mt.gov/publichealth/cdepi/diseases/lead.aspx; "Childhood lead poisoning: preventable exposure to lead continues in Montana," *Montana Public Health Prevention Opportunities Under the Big Sky*, Vol. 7, Issue 12, December 2012, http://dphhs.mt.gov/Portals/85/publichealth/documents/MPH/MPH%202012/2012-12MPH.pdf.

## Reporting Requirements

As stated in the Methodology section above, "All" in the columns showing the reporting requirements in Tables 1.A – 1.D (column D of Tables 1.A and 1.B and column B of Tables 1.C and 1.D) means that states require all laboratories and at least all health care providers using point-of-care analyzers to report results of tests for children under age 6 to the state health department.[41] Most states (40 + D.C.) do this. One state, Pennsylvania, requires *all* results to be reported by traditional laboratories, but doctors using point-of-care machines only have to report results over a certain threshold. Others require reporting of results only at or above 5 µg/dL or 10 µg/dL (and in one case, at or above 2.3 µg/dL). One state – Nevada – did not have a clear statewide reporting requirement, although "exposures and elevated levels" are reportable in Clark County.[42]

## States with Universal Testing Requirements

Table 1.A shows that universal screening is required in 10 states and the District of Columbia: Connecticut, Delaware, Iowa, Louisiana, Maryland (for at least three years beginning in 2016, for children born on or after January 1, 2015), Massachusetts, New Jersey, New York, Rhode Island and Vermont.[43] All of the states listed above except Delaware and Iowa require all children in their state to be tested for BLLs at or close to ages 1 and 2.[44] Several of these have additional testing requirements.[45] For example, Massachusetts mandates universal testing at age 3, testing for children living in high-risk areas at age 4, and additional testing when warranted by specific risk factors.

> "… universal screening is required in 10 states and the District of Columbia."

Delaware requires universal testing only at or around 12 months, and children between 22 and 26 months old are tested based on positive answers to a risk questionnaire.[46] Iowa mandates blood lead testing for all children entering kindergarten, before age 6 or as soon as possible after and strongly encourages that children be tested by age 2.

For children born before 2015, Maryland requires testing at 24 months of age if they have lived in an "at-risk" area as designated in 2004; if they have never lived in one of these at-risk areas, they must still be tested if indicated by the required risk questionnaire or if a parent requests it (or if the child is enrolled in Maryland's Medicaid program).[47]

Some of these states reported on the percentage of children who were tested in specific age groups at least once, ranging from 68% to over 100%. For example, Iowa reported testing 100.5% of their children born in 2009 by the time they were 6 years old, and it's likely that most of this testing happened by age 3.[48] Connecticut tested 97% of children born in 2011 at least once before age 3; New Jersey reported that 75% of children who turned three during the period July 2013 to June 2014 had at least one lead test. DC reported testing 91% of children two years old by July 1, 2015. Rhode Island reported that 78% of children who turned 36 months in 2015 received at least one test by 18 months of age. Vermont stated that 80% of children aged 1 and 68% of children aged 2 were tested for lead in 2015 (although they noted these may include more than one test per child for the reporting year). In Massachusetts, 76% of children 9 - 47 months of age were reported as tested in 2015.[49]

Four states also reported on whether children received two tests. In DC, by July 1, 2015, 31% of children 24 to 35 months old were reported to have received lead tests in both of the statutorily required age ranges. In Connecticut, 53% of children born in 2011 were tested around age 1 and

2. Rhode Island reported that 55% of children who turned 36 months in 2015 had received two tests at least 1 year apart. New York indicated 56% of children born in 2011 were tested at least twice by 36 months.

Health care providers are largely responsible for making sure children are tested for lead or for administering the test themselves. In some cases, health care facilities are also given this task. However, Iowa's Administrative Code makes it the responsibility of the students entering kindergarten (and, by extension, their parent or guardian), and of school authorities.[50]

## States with Requirements to Test Less Than Universally but Beyond the Medicaid Population

Eight states have targeted testing requirements for children, beyond Medicaid policies: California, Illinois, Maine, Michigan, Missouri, Ohio, Virginia, and West Virginia.[51] These states require blood lead testing for children with a risk factor for lead exposure, including such factors as living in housing built before 1950, living near a lead smelter, or receiving benefits from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). (See the Appendix for a sample risk assessment.) Some of these states have also designated specific high-risk zip codes for testing based on calculations of where children are most likely to be exposed to lead – e.g., where there is a high percentage of old housing and poverty.

West Virginia's testing rate for children under 72 months is notably low compared with the other states that have testing requirements. This may be because West Virginia staff did not consistently refer to the screening policy as a requirement and mentioned only encouraging testing by sending letters to providers reminding them to screen.[52]

> "Eight states have targeted testing requirements for children, beyond Medicaid policies."

Many states also used inconsistent terminology that would make it difficult for a parent or potentially even a doctor to know when testing is or isn't required. A few states have issued risk assessments or screening guidelines stating or implying that children *should* be tested after an affirmative answer to one of the questions, while the laws required this testing through the use of *shall*.[53]

## States that Have Public Policies for Recommended Testing Only (aside from Medicaid screening requirements)

Many states (27) only recommend blood lead testing for specific groups of children, outside the Medicaid population.[54] These suggestions mostly follow the same pattern as in states with targeted screening requirements.

> "Many states (27) only recommend blood lead testing for specific groups of children, outside the Medicaid population."

Some of these recommendations were hard to find or unclear. For example, Pennsylvania had only limited recommendations on their website, mainly in a "Frequently Asked Questions: Lead Poisoning" document whose link was off to the side of the main page.[55] Alaska's testing recommendations were not immediately apparent from a search of their website. The current and official recommendations were confirmed to be at the end of a 2014 bulletin entitled: "Blood Lead Surveillance in Children Aged < 18 Years – Alaska, 1995-2012."[56] A few states, such as Georgia and Indiana, stated in screening plans that a test was "necessary" for children at risk without legal requirements for the testing.

Staff in Hawaii and Kansas mentioned their lead programs lost CDC funding but recommendations can still be found on their websites. Despite its law encouraging providers to test, Nevada no longer has an active state lead poisoning prevention program. One county in that state has its own reporting requirement for blood lead tests and its own procedures for case management.[57]

A 2015 New Hampshire law requires that state's health department to issue regulations for doctors to ensure testing of 1- and 2-year-olds living in high risk communities and those enrolled in Medicaid, WIC, or Head Start, if screening percentages in those populations aren't at 85% by 2017.[58] In Pennsylvania, the governor and health department staff support a universal testing mandate, and legislation has been introduced to require this.[59]

## States Without Official Screening Recommendations (apart from Medicaid)

Five states – Arkansas, Montana, North Dakota, South Dakota, and Wyoming – provided no recommendations on the Internet regarding which population of children to screen, outside the Medicaid population. A few of these states had no state-maintained childhood lead poisoning prevention website.[60] Interviewed by phone, health department staff from two states said they recommended that all children be tested,[61] although it's unclear how widely or strongly these recommendations are communicated to doctors or parents. Staff from North Dakota recommends doctors use the state Medicaid questionnaire to screen children whether or not they are enrolled in Medicaid to determine whether they should be tested.[62]

With no official recommendations on the state websites, parents may not have access to definitive state-specific guidance on when they should have their child tested for lead poisoning, or on lead poisoning prevention. Many of the other states' websites provided a variety of helpful tips, like sources of lead that are especially relevant to residents, in addition to proper house cleaning techniques and nutrition to minimize the chance of lead poisoning.

# IV. State Policies for Testing Medicaid-enrolled Children

Table 2 assesses states' adherence to the federal CMS requirement to test children receiving the Medicaid EPSDT benefit at 12 and 24 months (or notes whether they received approval for targeted testing). The table provides an indication of the level of compliance in the column entitled "% of kids receiving at least 1 test by age 2." In addition, while CMS requires that children receiving this benefit be tested between 36 and 72 months if not tested earlier, this component of the policy is not discussed in the table because the available data did not indicate whether children received tests in this age range.[63]

In the table below, the percentages are either directly from or derived from lead screening data issued by the National Committee for Quality Assurance. For more detail, please refer to the Methodology section of this report.

## Table 2 – State Medicaid Testing Policies Compared with Federal CMS Requirement; Testing Rates

| State | State Follows Federal Requirement | | State Policy Is Formally Weaker | % of kids receiving at least 1 test by age 2 (2014) |
|---|---|---|---|---|
| | Via law, reg., contract? [A] | Via manual, staff statement, website? | | |
| **MA** | Univ. testing reg. | | | **90%** |
| **DC** | Univ. testing reg. | | | 86% |
| **MN[B]** | | EPSDT screening schedule & fact sheet | | 85% |
| **IA** | Univ. testing reg. strongly encourages a test by age 2 (requires it by age 6) | Staff reiterated CMS requirement | | 84% |
| **NY** | Univ. testing reg. | | | **84%** |
| **RI** | Univ. testing reg. | | | 83% |
| **IL[C]** | | EPSDT provider manual | | 81% |

| State | State Follows Federal Requirement | | State Policy Is Formally Weaker | % of kids receiving at least 1 test by age 2 (2014) |
|---|---|---|---|---|
| | Via law, reg., contract? [A] | Via manual, staff statement, website? | | |
| **GA** | | EPSDT provider manual | | 80% |
| **WI**[D] | | Medicaid handbook, notes req. as federal | | **80%** |
| **MI**[D] | | Health department screening guide, notes the req. as federal | | **79%** |
| **PA** | | Provider bulletin with periodicity schedule; must test according to this to get paid | | **77%** |
| **NJ** | Univ. testing reg. | | | 76% |
| **HI** | | Staff confirms state follows CMS mandate via Managed Care | | 75% |
| **MD**[E] | Reg. | | | **74%** |
| **TN** | Managed Care Contract | | | **74%** |
| **LA** | Univ. testing reg. | | | 68% |
| **VA** | Reg. | | | **68%** |
| **CA** | Reg. (with limited exceptions) | | | 67% |
| **U.S.** | | | | **67%** |
| **DE** | Univ. testing law, for 12 mo. | Provider manual, for 24 mo., but in section listing which tests "should" be done; state Medicaid staff deferred to lead program staff to clarify | Acc. to recent statement by lead program staff: 24-month-olds required to be tested only if "high risk"; Medicaid enrollment is not an explicit risk factor | 66% |

| State | State Follows Federal Requirement | | State Policy Is Formally Weaker | % of kids receiving at least 1 test by age 2 (2014) |
|---|---|---|---|---|
| | Via law, reg., contract? [A] | Via manual, staff statement, website? | | |
| **KY** | 1998 EPSDT manual, incorporated by reference into reg. | | | 66% |
| **NE** | Public health division screening guide and website provide the CMS requirement as such; supported by state law | | State Medicaid rule only requires testing at 12 mo. (despite public health division's statements) | 65% |
| **NH[E]** | | Staff said federal requirement is told to providers | | 65% |
| **FL** | Model Managed Care contract, covering almost all kids receiving EPSDT benefit | | | **64%** |
| **MO** | State lead program rule | EPSDT provider manual, notes req. as federal | | 63% |
| **OH** | (State) rule, but stated as federal, not state, requirement | | | **62%** |
| **MS** | Reg. | | | 59% |
| **SC** | | Medicaid provider manual, notes req. as federal | | **59%** |
| **IN** | | EPSDT provider manual (but parents need to give informed consent) | | 55% |
| **WV** | | EPSDT provider manual | | 52% |
| **CO** | Staff indicates EPSDT rule should be interpreted as requiring this | Directly stated in non-binding billing manual, as CMS req. | | 49% |

| State | State Follows Federal Requirement | | State Policy Is Formally Weaker | % of kids receiving at least 1 test by age 2 (2014) |
|---|---|---|---|---|
| | Via law, reg., contract? [A] | Via manual, staff statement, website? | | |
| **KS** | | Staff says Kansas requires this testing; providers are given a link to the federal EPSDT website/ manual; no state manual anymore | | 49% |
| **NV** | | EPSDT manual | | 41% |
| **TX** | | Periodicity schedule & Medicaid provider manual state CMS req. | | **39%** |
| **NM** | | Staff statement | | 35% |
| **UT** | | | Acc. to staff: State currently doesn't mandate testing of Medicaid-enrolled children | 22% |
| **WA[E]** | | Medicaid handbook states CMS req., since 2016 | | 13% |
| **AL** | | EPSDT appendix to Medicaid provider manual | | Not available |
| **AK** | | | Screening is required as appropriate for age & risk, but doctors have discretion on whether to test | Not available |
| **AZ** | CMS has approved targeted screening | | | Not available |
| **AR** | | EPSDT provider manual | | Not available |
| **CT** | In effect, required in universal testing reg. | | | Not available |
| **ID** | Reg. | | | Not available |
| **ME** | Law | | | Not available |

| State | State Follows Federal Requirement | | State Policy Is Formally Weaker | % of kids receiving at least 1 test by age 2 (2014) |
|---|---|---|---|---|
| | Via law, reg., contract? [A] | Via manual, staff statement, website? | | |
| **MT** | | | Testing is required but specific ages are only recommended | Not available |
| **NC** | | Medicaid billing manual, as federal requirement; note staff said providers would have federal, not state, problem for not testing | | Not available |
| **ND** | | EPSDT provider manual, as federal req. | | Not available |
| **OK** | Reg. | | | Not available |
| **OR** | | "Coverage" manual directs providers to test at the federally required ages | | Not available |
| **SD[F]** | Reg. | | | Not available |
| **VT** | Univ. testing reg. | | | Not available |
| **WY** | | Medicaid provider manual | | Not available |

## Notes for Table 2

***A*** – This column also includes the one state whose targeted testing policies have been approved by CMS: Arizona.

***B*** – From 2003 to 2013, in contracts with managed care organizations, Minnesota's Medicaid agency withheld part of the reimbursement for well-child visits if blood lead tests were not administered. Staff said this resulted in some screening rates exceeding 80% around 2013, and is probably a factor in the 85% rate shown here from 2014. Minnesota Department of Human Services staff, Personal communication, September 13, 2016; Minnesota Department of Health, "2015 Blood Lead Surveillance Report," p. 11, http://www.health.state.mn.us/divs/eh/lead/reports/surveillance/annualreport2015.pdf

***C*** – At least one Medicaid plan in Illinois provides a direct bonus payment if providers test a certain percentage of children for lead by 24 months of age. Illinois Department of Public Health, "Illinois Lead Program 2014 Annual Surveillance Report," October 2015, p. 26, http://idph.prod.acquia-sites.com/sites/default/files/publications/leadsurveillance-report2014-rev101916-102116.pdf

***D*** – Wisconsin issued Medicaid Provider Testing Reports to individual providers through 2011, and this had helped increase testing rates. See "Impact of State Policies on Testing Rates" within this section (IV) and Section V. Best Practices, below.

In 2014 at least, Michigan sent Medicaid Managed Care Plans information on their patients' lead testing status to help boost compliance with the testing requirement. Scott, Robert, et al., "2014 Data Report on Childhood Lead Testing and Elevated Levels: Michigan," Revised March 14, 2016, page 2, http://www.michigan.gov/documents/mdhhs/2014_Child_Lead_Testing_and_Elevated_Levels_Report_515233_7.pdf

***E*** – The data is from 2014, before Maryland instituted universal testing of children born in 2015 and after (although the state had already required all children enrolled in Medicaid to be tested at 12 and 24 months prior to instituting universal

testing); before New Hampshire began telling its providers about the federal requirement (which was spurred by the law passed in 2015 – see fn58); and before Washington State updated its lead testing policy.

Md. Code Regs. 10.11.04.04, http://www.dsd.state.md.us/comar/comarhtml/10/10.11.04.04.htm; New Hampshire Department of Health & Human Services staff, Telephone interview, June 24, 2016; Washington State Health Care Authority, "Washington Apple Health Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Program Provider Guide," April 1, 2016, p. 2, http://www.hca.wa.gov/assets/billers-and-providers/epsdt_20160401.pdf

***F*** – South Dakota Department of Social Services staff also said via email dated June 9, 2016 that the state cannot require the test to be done.

## Are Medicaid-Eligible Children at Increased Risk?

As discussed above, it is a federal CMS requirement for children enrolled in Medicaid/EPSDT to be tested for lead at 12 and 24 months, and between 36 and 72 months if not tested previously, absent approval for targeted screening. The targeted screening exception was based on CDC's recommendation, and CDC recommended this in part because the data indicated children enrolled in Medicaid were not necessarily at a higher risk for EBLLs.

> "... the data indicated children enrolled in Medicaid were not necessarily at a higher risk for EBLLs."

A few states have actively determined whether the disparity in EBLL risk still exists or whether other risk factors are more prominent. Arizona successfully applied for targeted screening approval.[64] Nevada and Washington State have applications pending, indicating that they believe Medicaid-enrolled children, as a group, are not at increased risk.[65] On the other hand, Pennsylvania Medicaid staff indicated the state made a conscious decision to continue universal testing of the Medicaid population.[66] Wisconsin analyzed its data and found that in 2014, "Medicaid-enrolled children in Wisconsin [were] at three times greater risk of lead poisoning than non-Medicaid-enrolled children."[67]

## Stated Compliance with CMS Requirement

As shown in Table 2 above, not all states say they adhere to the CMS requirement to test children receiving the EPSDT benefit at 12 and 24 months. Utah staff explicitly stated by email that they don't require lead testing for Medicaid-enrolled children.[68] Since 2010, Alaska regulations have required "lead screening appropriate for age and risk factors," but they stop short of actually requiring doctors to do testing specifically at 12 and 24 months, instead leaving this up to the doctor's discretion.[69] Likewise, Montana requires doctors to test patients in EPSDT for lead, but only *recommends* the testing happen at 12 and 24 months.[70]

Two states were unclear on their compliance. Nebraska's Medicaid regulations (implemented by the Division of Medicaid & Long-Term Care) only require testing at 12 months, but the state's Division of Public Health is required by law to establish a lead program that requires BLL testing of Medicaid-enrolled children.[71] Public Health staff implemented this requirement in 2012.[72] Delaware Medicaid staff referred Safer Chemicals, Healthy Families (SCHF) to the lead program staff when asked to clarify the policy stated in their manual, and the lead program staff said the state only required two-year-olds to be tested based on risk factors unrelated to Medicaid enrollment status.

# Impact of State Policies on Testing Rates

No state reports testing all children enrolled in Medicaid at least once by age 2, although some come close. Generally speaking, the states with higher testing rates in 2014 (higher than the national benchmark) either already aimed to test all children through universal screening laws, or tended to treat the requirement as a state requirement, instead of a solely federal requirement. For several years, a notable exception to this was Wisconsin. Although this state framed the requirement in its provider manual as the federal requirement, from 2006 through 2011, state Medicaid staff collaborated with lead program staff to send reports to providers showing them their testing rate and identifying children who needed to be tested. This program had a significant impact on testing rates. The state's own data showed that the 2014 testing rate was still higher than the pre-2006 rate, suggesting that the reports had a lingering effect even after they were discontinued.[73]

# V. Best Practices: Highlights From Successful Programs

SCHF researched the testing programs in several states to identify the reasons for their success. The best practices are described below.

## Universal Testing Requirements: Strategic Education to Encourage Compliance

As shown in Table 1.A, most of the universal testing states have high screening rates. None of the universal testing states mentioned actively enforcing the laws that required testing. Staff in at least a few states indicated that parents bear responsibility for getting their child tested by bringing them to appointments.

Instead, these state lead programs encourage compliance, mostly through education to providers and parents. Louisiana has a social marketing campaign.[74] New Jersey partners with regional coalitions to help publicize the testing requirement.[75]

Massachusetts is very hands on in engaging with doctors and reminding them of the testing regulation. Staff frequently call doctors and visit them, they encourage providers to do venous rather than capillary testing to get a more reliable BLL more quickly, and they investigate reasons for low screening rates in specific communities. Lead program staff also remind doctors who aren't testing of their obligation through formal letters.[76]

> "... these state lead programs encourage compliance, mostly through education to providers and parents."

Connecticut developed media campaigns on residential lead sources directed toward parents of children in the populations that are historically most likely to have EBLLs. The state also ensures that doctors know of the testing requirement, and doctors were part of an advisory committee providing input on the content of the initial 2009 screening law and subsequent guidance.[77]

## Data Matching & Provider Reports

A very successful "best practice" is when lead program staff are able to combine the blood lead test records of children with other state-wide registries, such as an immunization registry or Medicaid registry, to identify children who have not received a blood lead test, and use it to show providers their testing rate or who specifically needs to be tested.

Rhode Island utilizes KIDSNET, a child health registry that captures not just immunization data and lead screening data, but WIC data and home visiting data.[78] Providers can run reports for their practice to identify children who have not been screened at all and which ones need a second test in accordance with state law. Department of Health staff can identify providers who are not running reports. On a quarterly basis, they check the system and send reports to those offices.[79] This probably contributes to the state's high testing rate: out of children who turned 36 months in 2015, 55% had been tested twice at least 12 months apart and 78% of those children received at least one test by 18 months.[80]

Wisconsin's experience highlights the importance of putting a list of who needs to be screened directly in front of providers, rather than simply offering them the option to access a database with that information. As indicated above, for six years, the state lead program collaborated with the state Medicaid agency to successfully create and distribute Medicaid Provider Testing Reports, and saw testing rates rise.[81] They lost funding and had to discontinue the program after 2011. Testing rates have decreased each year since, in spite of the state's continued maintenance of its Blood Lead Registry, which allows providers to see a child's entire blood lead test history.[82]

"Wisconsin's experience highlights the importance of putting a list of who needs to be screened directly in front of providers, rather than simply offering them the option to access a database with that information."

North Carolina's lead program staff had also created Medicaid Provider Report Cards, although the loss of grant funding stopped the program. They plan to resume the practice, since it was very effective.[83]

## Covering the Cost of Lead Testing

Two state's websites estimate blood lead test analysis by state laboratories to cost $11 or $25. One county health department charges up to $43 for the test.[84]

The Affordable Care Act (ACA) requires health insurance plans subject to it (all non-grandfathered plans) to fully cover "lead screening for children at risk of exposure."[85] The ACA regulations define lead screening by the recommendation in the Bright Futures/American Academy of Pediatrics' periodicity schedule. At 12 and 24 months of age, the schedule recommends "risk assessments or screenings as appropriate, based on universal screening requirements for patients with Medicaid or in high prevalence areas."[86] At other ages, testing is recommended only after a positive response to a risk assessment.

CDC has interpreted the Bright Futures/American Academy of Pediatrics' recommendations at ages 12 and 24 months to include testing for children "living in high-risk areas as defined by the state or local health departments."[87] Louisiana and Maryland, for example, became universal testing states when they designated all areas of their state as "at high risk" or "at risk."[88] However, two other universal testing states, Delaware and Massachusetts, likely did not make that designation, since they label only *certain* areas of their states as "high risk," and require testing for children living in those places at additional ages beyond the universal testing age(s).[89]

In some universal testing states and others, as noted in Tables 1.A and 1.B, state law unambiguously requires insurance plans to cover testing, regardless of ACA coverage. These state laws also apply to grandfathered plans that are exempted from the ACA's requirements. In 2016, 23% "of covered workers are enrolled in a grandfathered health plan."[90]

Lead program staff in some states, such as Minnesota and North Dakota, who did not know of a state requirement for private insurance to cover blood lead tests stated that they haven't heard of coverage being denied. Vermont staff stated that insurance companies pay for the entire test or most of it.

Free or low-cost testing is offered in several states, sometimes at a local health department, to children who are uninsured or underinsured. For example, New Jersey's local health departments are required to provide free screening to this population,

accounting for an estimated 2% of the annual lead tests in the state.[91]

State Medicaid programs generally cover blood lead tests at the CMS-required ages.

## Increasing the Accessibility of Testing with "Point-of-Care" Machines

Children are more likely to be tested for BLLs when doctors can perform the blood lead testing in their offices, instead of writing an order to be filled at a distant laboratory. "Point-of-care" blood lead testing machines, such as LeadCare® II analyzers, have become popular. They allow doctors to analyze a blood lead test right in their offices and provide immediate feedback to patients on whether they need any confirmatory testing.

"Children are more likely to be tested for BLLs when doctors can perform the blood lead testing in their offices, instead of writing an order to be filled at a distant laboratory."

Point-of-care machines are widely used throughout the U.S. The Vermont Department of Health works with the state chapter of the American Academy of Pediatrics to provide LeadCare II analyzers free of charge to selected practices; Idaho provides them free to doctors testing patients enrolled in Medicaid.[92] New Jersey provides them to local health departments to conduct screening.[93]

Wisconsin reported that it is challenging to get doctors to report all of the results from analyses with LeadCare II machines. Pennsylvania, for example, does not require doctors to report the results of all in-office testing and analysis.[94]

## Requiring Proof of Lead Testing for Enrollment: a Double-Check on Compliance

Several states require a statement that a child has been tested for lead as a condition of enrollment in schools or child care facilities: the District of Columbia, Delaware, Iowa, Illinois, Maryland, Massachusetts, Missouri, New York, and Rhode Island.[95] According to state staff, two local health departments in Connecticut also require this proof.[96] The requirement can serve as a double check on whether the required screening actually took place.

However, only two states indicated that children are prevented from enrolling or remaining in school without having a test per their requirements– Connecticut (the two local health departments) and Delaware.[97] New York stated that child care providers "must try to obtain proof," but the child can't be excluded from child care without documentation of a test and is just referred to get the testing.[98]

With the exception of Iowa Department of Public Health and the Delaware Department of Education, none of the state agencies we spoke with seemed likely to monitor compliance with these rules. Personnel in the District of Columbia's Office of State Superintendent of Education, for example, only make sure the centers or schools are checking for the blood lead test and don't check the tests themselves.[99]

The Iowa Department of Public Health sorts through records to determine which children are not in compliance and the Department asks the

school to tell the parent to get their child tested. Although they can't follow up on every case and they depend on education, the compliance rate is high.[100] The Meriden Local Health Department in Connecticut reports that its requirement is also working well.[101] Delaware Department of Education staff monitors kindergartners' electronic medical records to check on compliance.

In addition to asking whether this requirement would help increase screening rates, selecting the appropriate ages for testing is a key factor. Although Iowa, for example, is able to ensure a high number of children are screened because more children go to kindergarten than preschool or childcare facilities, this means the test isn't required until around 5 or 6 years old. This is after the critical testing ages of 1 and 2 years, so elevated levels could already have been missed. Most of the other states (except Massachusetts and Meriden in Connecticut) impose the requirement starting earlier than kindergarten.

Delaware staff believes this requirement boosts testing rates, as they see an increase in the number of lead tests reported around late summer and early fall, when the school year begins.[102]

## Requiring All Test Results To Be Reported

As indicated in Tables 1.A – 1.D, 40 states and the District of Columbia require all laboratories and at least all health care providers conducting in-office BLL analysis (such as with LeadCare II analyzers) to report all BLL test results for children under 72 months to the state.

## Funding the Programs

Most states rely heavily on CDC funding for their lead programs. By contrast, California has established a "Childhood Lead Poisoning Prevention Fee" to pay for "health care referrals, environmental assessments, and educational activities" related to lead exposure.[103] This annual fee is generally assessed on manufacturers "responsible for identifiable sources of lead" that currently or historically were significant contributors to environmental lead contamination.[104] This includes businesses in the petroleum and paint industries and facilities that release lead into the air.

# VI. Universal versus Targeted Screening

Universal testing, especially when the testing is affordable and accessible, and when providers and parents are sufficiently engaged, can lead to high screening rates to identify more children with high BLLs. Testing according to targeted requirements and even recommendations, when they are strong and clear, reinforced by educational efforts, and supported by the medical community, can also lead to a successful screening program, although universal screening is still preferable.[105]

CDC moved toward targeted testing as higher levels could be linked to specific locations in a state. By now emphasizing targeted testing, CDC encourages states to use common knowledge about lead sources and their own data to develop plans that test children who are most likely to be exposed to lead. However, that can be a risky approach when not all lead sources are known. The potential dangers of lead pipes were largely thought solved until recently. Lead in candy can also be a source, but some state questionnaires don't ask if the child eats imported candy. Lead in soil from industry can contribute to EBLLs, but questionnaires don't always ask whether children live near current or former lead-emitting industries. Targeted screening is only as good as the criteria chosen to determine the target.

## The Utility of Questionnaires in Targeted Screening

Many states (39 + the District of Columbia) recommend or require that doctors administer risk assessment questionnaires or at a minimum ask questions about risk to determine whether to test children for lead.[106] Examples of the kinds of questions commonly asked include:[107]

- Does the child live in or frequently visit a building built before 1950?
- Does the child live in or frequently visit a building built before 1978 that was recently renovated?
- Does the child's sibling or playmate have lead poisoning?
- Is the child an immigrant, refugee, or foreign adoptee?
- Does the parent or caregiver have a job or hobby involving lead?
- Does a member of the household use ethnic remedies, cosmetics, imported pottery with a lead glaze, or imported candy?

These questions cover many sources of lead – lead paint in older housing, especially if the paint is deteriorating and being disturbed during remodeling; lead brought into the house by an adult who may have lead on their shoes or clothing; and lead from other countries, where the regulations lag behind the U.S.

But not all states actually use all of these types of questions in their risk assessments. California, for example, only requires testing for children receiving services from publicly supported programs such as California's Medicaid program and WIC, and for those spending a lot of time in a structure built before 1978 that was recently renovated or where the paint is in disrepair.[108] Doctors in California aren't required to ask if children have eaten candy manufactured outside the U.S., when this could be a serious source of lead poisoning. Staff in the Nevada Department of Health and Human Services noted a concern about lead in candy imported from Mexico.[109] Most universal screening states found some lead exposure came from imported items, such as food coloring, spices, makeup, or pottery.

Even states with more extensive questionnaires may not cover sources that could be important. Only very few address lead in water from lead pipes or plumbing fixtures. Lead pipes weren't banned from use in new installations or repairs until 1986,

and even then, pipes were still allowed to have 8% lead until 2014. While water is not generally the largest source of lead exposure, it can add to other sources of lead in the environment and raise BLLs enough to cause serious health effects, as has happened in Flint, Michigan.

While it is generally acknowledged that questionnaires *can* be an effective tool for finding BLLs above 10 µg/dL, CDC's previously designated "level of concern," they aren't always effective, as the CDC's Advisory Committee on Childhood Lead Poisoning Prevention concluded after analyzing several studies.[110] One reason for the ineffectiveness may be that all parents don't know the age of their homes, which is a standard question used to determine risk in lead risk assessments. A 2003 study compared parents' responses to "Does your child live in or regularly visit a house that was built before 1950?" with the age of their house, ascertained via tax assessor records. Overall, just over half of the parents who should have responded yes based on their house's age did in fact "accurately [report] this exposure." Fewer than half of the parents of children with Medicaid insurance who lived in pre-1950s housing answered correctly.[111]

Further, risk assessments may not be effective in identifying children with BLLs under 10 µg/dL. A 2012 study published in *Public Health Nursing* found that verbal lead risk assessment questionnaires were not effective in consistently detecting measurable BLLs in children. In fact, the group of children whose parents answered "no" to all questions and would not normally be tested, had slightly higher, although not significantly different, average BLLs than those with at least one "yes" or "don't know" answer (2.2 µg/dL v. 1.6 µg/dL).[112] Although the higher average BLL was low, studies have found health impacts even at 2 µg/dL. The overall finding of the *Public Health Nursing* study was that universal testing is necessary to detect measurable BLLs so the sources can be found and eliminated.[113]

> "While it is generally acknowledged that questionnaires *can* be an effective tool for finding BLLs above 10 µg/dL … they aren't always effective…"

Another concern with relying on questionnaires is that it's difficult to ensure doctors administer them. Most states only recommend risk assessments, but even for the states that require them, it may be difficult to monitor compliance aside from when it triggers a BLL test that is subsequently reported.[114]

## Maryland's Decision to Move Away from Targeted Screening

Testing children in pre-determined high-risk zip codes is another popular approach to targeted screening. Until 2016, Maryland required testing (without a risk assessment first) only for children living in a limited number of at-risk zip codes.

Maryland amended its regulations to require universal testing for 12- and 24-month-old children born in 2015 or after, by incorporating by reference the "Maryland Targeting Plan for Areas at Risk for Childhood Lead Poisoning," issued in October 2015 by the state Department of Health and Mental Hygiene (DHMH). This plan designates the entire state as "at risk" for lead exposure for three years.[115] The state plans to reevaluate whether universal testing is still necessary once three years of data have been collected.

In its 2015 Targeting Plan, DHMH discussed how progress has been made toward the state's goal of ending lead poisoning, but children still face exposure to lead, which "can cause permanent neurological damage that may be associated with learning disabilities, decreased intelligence, and behavioral problems."[116] The agency indicated that blood lead testing is an important part of an overall

lead poisoning prevention strategy, because interventions can be provided once children with lead exposure are identified.

The agency listed key reasons for changing the testing program from targeted to universal, including that the risk factors for elevated levels had changed and now included non-paint sources and sources that could not be identified. Additionally, with the CDC's recommendation of the new, lower reference level in 2012, DHMH surmised that more children could be at risk and should be tested. The agency wanted a testing strategy that was more effective in identifying children at risk to complement and strengthen the state's continuing primary prevention efforts.

To determine the best type of screening plan, DHMH considered universal testing and two different targeted screening plans – one based on the zip code distribution of past BLL test records, and the other on the geographical distribution of traditional risk factors such as housing age and poverty level. Compared with universal testing, the department estimated that both targeted models would miss a significant number of children expected to have BLLs of 5 µg/dL or higher.[117]

In other words, non-universal testing strategies exclude some at-risk children and wouldn't create a representative picture of lead levels. Using Maryland's historical data to create a testing plan could bias testing toward previously defined at-risk areas, since fewer children outside those areas were tested. Plans based largely on housing and demographics minimize the role of non-housing sources of lead (and by inference, they also ignore the fact that some sources of lead exposure cannot be identified). DHMH also noted that having universal testing for a limited time period "is easier and simpler to implement and communicate, and will provide useful data on the true prevalence and distribution of children with elevated blood lead levels in the State."[118]

"… non-universal testing strategies exclude some at-risk children and wouldn't create a representative picture of lead levels."

While universal testing and associated follow-up is expensive – DHMH estimated they ranged from around $4 million to $6 million for Maryland[119] – the costs of lead poisoning from *not* finding all children with elevated levels and addressing the sources are high. Beyond the health impacts, lead poisoning imposes economic costs, including those related to "lifetime earnings, tax revenue, special education, [and] criminal justice" because of lead's impact on IQ and on physical health.[120] According to DHMH, reducing all BLLs of 5 µg/dL or higher in those aged one and two in the state, identified through testing, would lead to cost savings of between $143 and $556 million.[121] DHMH translated this into a return of $24-142 for each dollar invested.[122] Addressing elevated lead levels has significant societal benefits, both for children's health and wellbeing, and for society as a whole.

## Lessons for Other States

Targeted screening has limitations. Most states use questionnaires to help doctors determine who to test, but their thoroughness varies and even the more rigorous ones may not identify all children with detectable or even elevated levels of lead. It is also difficult to ensure that they are used. Since Maryland has adopted universal testing for children born in 2015 and after for three years, testing decisions at 12 and 24 months for this population are not based on a risk assessment. However, the assessment is still required at well-child visits for other purposes.[123]

Maryland looked closely at two targeted screening models – based on historical BLL tests or demographics – and determined neither would suffice. It's likely that other states are in the same situation as Maryland, with significant numbers of children with elevated lead levels potentially overlooked by their current non-universal testing plan. In the next three years, Maryland will be able to establish a much more complete baseline of data and could have a strong foundation to move back to targeted testing if they find patterns to justify it.

"It's likely that other states are in the same situation as Maryland, with significant numbers of children with elevated lead levels potentially overlooked by their current non-universal testing plan."

Universal testing is also easier for doctors to follow – in Maryland's case, doctors are required to test all children born in 2015 and after at 12 and 24 months. They don't have to remember which zip codes they're supposed to test in.

States may have concerns about costs, and it is important to account for this in the development of a lead screening policy. Universal testing and associated follow-up is more costly than targeted testing, as indicated above. However, the long-term benefits, both financial and health-protective, clearly outweigh the short-term costs.

# VII. Conclusions and Recommendations

It's tragic that children are still exposed to lead in 2016, despite all that we know about its dangers. Since there is no safe level of lead in a child's blood, and symptoms from low levels of exposure are not immediately obvious, testing is a key part of a strategy to address lead exposures and prevent further injury. Most states agree that lead poisoning and EBLLs should be taken seriously. But some have made a greater commitment to tackling these issues. Table 3, below, summarizes the types of state lead testing policies.

## Table 3 – Summary of Lead Testing and Reporting Policies

| State policy | Number |
|---|---|
| Require universal testing | 10 + District of Columbia |
| Require targeted testing (apart from Medicaid policies) | 8 |
| Recommend targeted testing (apart from Medicaid policies) | 27 |
| Have no requirements or recommendations on website (apart from Medicaid policies) | 5 |
| Clearly follow the federal Medicaid lead-testing requirement | 45 + District of Columbia |
| Require BLL test results to be reported by all laboratories and at least all providers using point-of-care analyzers | 40 + District of Columbia |

No state reports testing 100% of the children they want to have tested for lead, where the testing policy requires testing of all children at the critical ages of 1 and 2. But, some are closer. One state recently took strong action to test more at-risk children and overhauled their program by adopting universal testing, recognizing that it could result in significant cost savings and improvements in health and wellbeing.

We analyzed the best practices employed by these states and used them as the foundation for our recommendations below.

## Recommendations for Successful State Testing Programs

### 1. Adopt universal screening to discover the full extent of elevated blood lead levels in children

States should determine whether to move to universal screening to better protect the children in their state, based on the data that is available and accounting for gaps in the data. As Maryland discovered, the new reference level of 5 µg/dL and the inherent limitations of targeted screening methods mean these methods may overlook significant numbers of at-risk children. Maryland found that reducing all BLLs of 5 µg/dL or higher in those aged one and two, identified through testing, would lead to cost savings of between $143 and $556 million. This translates into a return of $24-142 for each dollar invested, and is in addition to significant societal benefits both for children's health and wellbeing, and for society as a whole.

## 2. Implement strategic education campaigns for health care providers and parents

Simply adopting universal testing isn't enough to make the program successful. Lead program staff should be invested in its implementation. It's important to have regular contact with providers to remind them of their obligation to test, as Massachusetts does through phone calls, letters, and in-person visits. Another form of education is showing individual providers the names of children in their practice who need to be tested. The discussion in Best Practices above showed a close correlation between these "provider report cards" and higher testing rates. Providers have a lot to look for and document at a well-child exam, and these report cards can be effective reminders.

Parents may not bring their child to the doctor at the recommended intervals. Some parents also refuse blood draws. To overcome these obstacles, states should focus on community outreach and educating parents on the importance of having their children tested, especially at ages 1 and 2, and on the significant costs of not addressing lead poisoning.

To help disseminate the information, states can partner with non-profit organizations (or businesses) to expand the lead program's reach, similar to New Jersey's program.

## 3. Make the testing more accessible and affordable

When providers have to refer children to an outside laboratory for a blood lead test, follow-up may become difficult. In-office testing saves patients the trouble of going somewhere else, and enables them to see the results immediately and receive necessary follow-up services much more quickly.

It's important for doctors to have the ability to test using point-of-care devices. While these can be expensive, the Vermont Department of Health works with the state chapter of the American Academy of Pediatrics to provide LeadCare II analyzers free of charge to selected practices. Idaho provides them free to doctors testing patients enrolled in Medicaid.

Parents are more likely to get their child tested for lead if they know that the test is free or available at a low cost.

## 4. Require universal reporting of test results

States can't accurately assess their lead program if they do not receive all blood lead test results. It should be mandatory to report all BLL test results – including those from point-of-care devices – to the state's lead program.

## 5. Publish data on tests done at both 12 and 24 months

There is a gap in knowledge about the level of screening at the critically important ages of 1 and 2. All states should publish data on the rate of children who have been tested at both of these ages. This data was only available from four universal testing states. Many states provide data on the number of 1- and 2-year-olds in their state that are tested once in a given year, and CDC's Environmental Public Health Tracking Program provides data for most states on the percentages of children under three years old who were tested at least once for lead. However, to be most effective in identifying children with elevated levels, since children's BLLs are rising by age 1 and peaking around age 2, the tests should happen at both of these ages. Once this data is collected and reported, it will help states and stakeholders determine whether the children with the greatest need are actually being tested.

# Endnotes

**1** In correspondence with SCHF, staff in two states indicated their reporting requirement for in-office testing only applied to users of specific point-of-care machines (LeadCare® II).

**2** CDC's National Surveillance Data can differ from states' data because CDC runs states' raw data through various screens that may vary from how the states prepare their data for the public. In addition, four states indicated that they updated their data after providing it to CDC and CDC may not have received the updates. Note CDC's disclaimer on its website -"These data were collected for program management purposes. The data have limitations, and we cannot compare across states or counties because data collection methods vary across grantees. Data are not generalizable at the national, state, or local level. The chart represents only state-specific data and is not a population-based estimate, so we are not able to compare states against one another."

**3** CDC, "National Environmental Public Health Tracking Network," last updated September 25, 2015, http://ephtracking.cdc.gov/showHome.action; CDC Environmental Public Health Tracking Program staff, Personal communication, October 28, 2016

**4** The states are Illinois and Louisiana. The percentage for Illinois was calculated based on numbers in the state report. For Louisiana, we used 2010 census data as the denominator to calculate the screening rate since the state did not provide the relevant population numbers.

**5** The states are: Alaska, Illinois, Iowa, Louisiana, Nebraska, Texas, and Wyoming.

**6** Nebraska and Wyoming did not provide population data. U.S. Census Bureau, "American FactFinder" (data found under "Age," "2010 Census," "Single Years of Age and Sex"), generated by Jennifer Dickman using American FactFinder, October 17, 2016, http://factfinder2.census.gov. We used this data by adding together the population numbers for children under 5 with those aged 5 to obtain the population under age 6.

**7** Quality Compass 2015 is the source for benchmark data, shown in bold in Table 2, and the individual plan data used to calculate the rates for the other states, shown in non-bold text. This data is used with the permission of the National Committee for Quality Assurance (NCQA). Quality Compass 2015 includes certain HEDIS data. Any data display, analysis, interpretation, or conclusion based on these data is solely that of the authors, and NCQA specifically disclaims responsibility for any such display, analysis, interpretation, or conclusion. Quality Compass® and HEDIS® are registered trademarks of NCQA.

**8** A similar measure is found on CMS Form-416, where CMS requires states to submit annual data on the number of screening blood lead tests for children under 6. Since a child can have more than one screening blood lead test in a given year, this data does not necessarily show the number of unique children who are tested. "CMS-416 Final Revised Instructions Questions and Answers February 2015," *Medicaid.gov*, answer to Question 13, https://www.medicaid.gov/medicaid/benefits/downloads/416-faqs.pdf

**9** Note that lead was not entirely removed from these items – paint for consumer uses can still contain 0.009% lead by weight; the limit has been in effect since 2009. 16 C.F.R. 1303.1. Pipes, pipe and plumbing fittings, and fixtures are allowed to contain 0.25% lead across the wetted surface; solder and flux are allowed to have 0.2% lead, effective since 2014. Environmental Protection Agency (EPA), "Section 1417 of the Safe Drinking Water Act: Prohibition on Use of Lead Pipes, Solder, and Flux," last updated November 23, 2015, https://www.epa.gov/dwstandardsregulations/section-1417-safe-drinking-water-act-prohibition-use-lead-pipes-solder-and. Lead was first limited in paint for consumer uses to 0.06% by weight in 1978. Pipes, solder, and flux could contain any amount of lead until 1986, when the maximum allowable lead content was set at 8% and 0.2% for pipes and solder/flux, respectively. Chicago even required lead pipes to be used until the mid-1980s. Hawthorne, Michael and Jennifer S. Richards, "Chicago often tests water for lead in homes where risk is low," *Chicago Tribune*, February 26, 2016, http://www.chicagotribune.com/news/watchdog/ct-chicago-lead-pipes-water-testing-met-20160226-story.html. The sale of leaded gasoline for on-road vehicles was phased out by 1996; other uses are still allowed today. EPA, "EPA Takes Final Step in Phaseout of Leaded Gasoline," January 29, 1996, https://archive.epa.gov/epa/aboutepa/epa-takes-final-step-phaseout-leaded-gasoline.html

**10** Study: U.S. Department of Housing and Urban Development, "American Healthy Homes Survey: Lead and Arsenic Findings," April 2011, pp. 4, ES-1, and ES-8, http://portal.hud.gov/hudportal/documents/huddoc?id=AHHS_Report.pdf. A 2016 *New York Times* article indicates this is the most recent data. Wines, Michael, "Flint Is in the News, but Lead

Poisoning Is Even Worse in Cleveland," *The New York Times*, March 3, 2016, http://www.nytimes.com/2016/03/04/us/lead-paint-contamination-persists-in-many-cities-as-cleanup-falters.html.

**11** See pub. 1 in fn10, at p. 4 and ES-2; 34, 23 and 3.6 million represent 32%, 22%, and 3% of the total housing stock, estimated at 106 million. *Id*., at ES-1

**12** Lanphear BP, et al., "Environmental lead exposure during early childhood" [published correction appears in J Pediatr. 2002;140(4):490], J Pediatr. 2002;140(1):43-44, http://www.ncbi.nlm.nih.gov/pubmed/11815762

**13** Agency for Toxic Substances & Disease Registry, "Public Health Statement for Lead," August 2007, http://www.atsdr.cdc.gov/phs/phs.asp?id=92&tid=22

**14** CDC, "Lead: What Do Parents Need to Know to Protect Their Children?" last updated March 15, 2016, https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm

**15** AAP Council on Environmental Health, "Prevention of Childhood Lead Toxicity," *Pediatrics*, 2016;138(1):e20161493, p. 3, http://pediatrics.aappublications.org/content/early/2016/06/16/peds.2016-1493

**16** See fn13

**17** Advisory Committee on Childhood Lead Poisoning Prevention, "Interpreting and Managing Blood Lead Levels <10 µg/dL in Children and Reducing Childhood Exposures to Lead," *MMWR Recommendations and Reports*, 56(RR08);1-14;16, November 2, 2007, http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5608a1.htm

**18** A few publications assert that the effects of even low BLLs (related to IQ, behavioral issues, etc.) "appear to be irreversible" (e.g. – Advisory Committee on Childhood Lead Poisoning Prevention, "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention" January 4, 2012, https://www.cdc.gov/nceh/lead/acclpp/final_document_030712.pdf), but scientists are looking into what may be promising interventions in the areas of nutrition and intellectual/environmental stimulation to mitigate the negative impacts to an extent. Shell, Ellen Ruppel, "The Brains of Flint's Children, Imperiled by Lead, Could Still Escape Damage," *Scientific American*, July 1, 2016, http://www.scientificamerican.com/article/the-brains-of-flint-s-children-imperiled-by-lead-could-still-escape-damage/

**19** See fn17

**20** See fn15, at p. 5

**21** Wengrovitz, Anne and Mary Jean Brown, "Recommendations for Blood Lead Screening of Medicaid-Eligible Children Aged 1--5 Years," *MMWR Recommendations and Reports*, August 7, 2009, 58(RR09);1-11, http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5809a1.htm

**22** *Id*.; For the specific ages, see fn17, discussing CDC's recommendation on how states should implement their targeted testing strategies. In 2009, CDC's Advisory Committee wrote that in 1997, CDC recommended testing children only at age 3 if not previously tested, instead of from ages 3-6 or 36-72 months, in the situation where a state did not have enough data to develop a targeted testing plan. See fn21. This may be an outlier, as other publications reviewed by SCHF consistently discussed testing up to 72 months if there was no previous test.

**23** CDC Advisory Committee on Childhood Lead Poisoning Prevention, "Low Level Lead Exposure Harms Children" January 4, 2012, p. 23, https://www.cdc.gov/nceh/lead/acclpp/final_document_030712.pdf. In addition to the general recommendations for non-Medicaid-enrolled children, CDC provides specific recommendations for testing children who are refugees or international adoptees. CDC also recommends blood lead testing for pregnant women. CDC, "At-Risk Populations," last updated February 23, 2015, https://www.cdc.gov/nceh/lead/tips/populations.htm

**24** See fn14; CDC, "CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in '*Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention*,'" June 7, 2012, http://www.cdc.gov/nceh/lead/acclpp/cdc_response_lead_exposure_recs.pdf. This level will be updated every four years if warranted by new data. (See fn14.)

**25** The U.S. Department of Housing and Urban Development (HUD) recently proposed to initiate an environmental investigation and remediation of lead hazards in paint or soil of HUD-assisted housing when an occupant under age 6 is found to have a BLL of at least 5 µg/dL; the current trigger for intervention is 20 µg/dL. O'Brien, Matt, "HUD proposes

lowering acceptable lead level for children," *Business Insider*, August 31, 2016, http://www.businessinsider.com/ap-hud-proposes-lowering-acceptable-lead-level-for-children-2016-8. Many states have adopted 5 µg/dL as a level that should, at least, be confirmed through further testing and trigger monitoring once confirmed. According to a 2014 report, CDC believes that a finding of BLLs ≥ 5 µg/dL should trigger follow-up testing and education. Raymond, Jaime, et al., "Lead Screening and Prevalence of Blood Lead Levels in Children Aged 1-2 Years," *Morbidity and Mortality Weekly Report*, 63(02);36-42, September 12, 2014, http://www.cdc.gov/mmwr/preview/mmwrhtml/su6302a6.htm

**26** See fn14; CDC, "Preventing Lead Poisoning in Young Children: Chapter 1," 1991, Summary, http://www.cdc.gov/nceh/lead/publications/books/plpyc/Chapter1.htm#Summary.

**27** A few documents cited the source for this as the State Medicaid Manual – chapter 5, section 5123.2 D.1, available at https://www.cms.gov/Regulations-and-Guidance/guidance/Manuals/Paper-Based-Manuals-Items/CMS021927.html. This version is from 1998 so it does not reflect the option for targeted screening. The Medicaid law (42 U.S.C. 1396d(r)(1)(B)(iv), defining EPSDT services, as confirmed by a 1999 Medicaid bulletin (https://www.medicaid.gov/Federal-Policy-Guidance/DOWNLOADS/SMD102299.PDF) only requires "lead blood level assessment *appropriate for age and risk factors*" (emphasis added). Also, this section of the State Medicaid Manual indicates that the requirement is for all children *eligible* for Medicaid, and CMS policy documents state this as well, but CMS staff stated by phone on June 17, 2016 that practically, the requirement is only for children *enrolled* in Medicaid. Accordingly, in this report, "enrolled" is generally used to describe the requirement states must comply with.

**28** Mann, Cindy, "Targeted Lead Screening Plans," Letter, CMCS Informational Bulletin on *Medicaid.gov*, June 22, 2012, https://www.medicaid.gov/federal-policy-guidance/downloads/cib-06-22-12.pdf

**29** See fn21

**30** See fn28

**31** Ibid.

**32** Centers for Medicare and Medicaid Services staff, Telephone interview, June 17, 2016***;*** Neill, Kevin, "AHCCCS Medical Policy Manual (AMPM) Update, 2015-07," to Holders of AHCCCS Medical Policy Manuals, April 27, 2015, https://www.azahcccs.gov/shared/Downloads/MedicalPolicyManual/revisions/2015/WhatsNew07.pdf

**33** Washington State Department of Health, "Blood Lead Testing and Reporting," accessed on October 21, 2016, http://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/HealthcareProfessionsandFacilities/ProfessionalResources/BloodLeadTestingandReporting; Nevada Department of Health and Human Services staff, Telephone interview, July 19, 2016

**34** Committee on Energy & Commerce Democrats, "Pallone & Wyden Ask CMS for Information on Lead Screening Practices," June 24, 2016, https://democrats-energycommerce.house.gov/newsroom/press-releases/pallone-wyden-ask-cms-for-information-on-lead-screening-practices

**35** CDC, "Preventing Lead Poisoning in Young Children," August 2005, p. ix, http://www.cdc.gov/nceh/lead/publications/prevleadpoisoning.pdf

**36** Committee on Energy & Commerce Democrats, "In Light of Flint Water Crisis, Committee Democrats Request Information on Federal Investments to Prevent Lead Poisoning," February 17, 2016, https://democrats-energycommerce.house.gov/newsroom/press-releases/in-light-of-flint-water-crisis-committee-democrats-request-information-on; CDC Healthy Homes and Lead Poisoning Prevention Program staff, Telephone interview, July 27, 2016

**37** CDC, "Fiscal Year 2015 Justification of Estimates for Appropriations Committees," p. 240, http://www.cdc.gov/budget/documents/fy2015/fy-2015-cdc-congressional-justification.pdf; CDC, "PPHF 2014," last updated December 9, 2014, http://www.cdc.gov/nceh/lead/funding.htm

**38** See pub. 2 in fn37; CDC, "Fiscal Year 2017 Justification of Estimates for Appropriations Committees," p. 322, http://www.cdc.gov/budget/documents/fy2017/fy-2017-cdc-congressional-justification.pdf

**39** Note that only the strongest policy is listed for each state – e.g., if a universal testing state also *recommended* testing under certain conditions, only the universal testing was noted.

**40** Head Start programs are excluded from this category because those testing requirements are linked to state Medicaid/EPSDT policies and are much more common among states. "Proof of lead test" requirements for enrollment in other programs appear to be less common and can help distinguish states.

**41** See fn1

**42** Southern Nevada Health District, "Reportable Diseases and Conditions," accessed October 21, 2016, https://www.southernnevadahealthdistrict.org/disease-reporting/disease-reporting.php. NRS 442.700, 3. states: "Each qualified laboratory that conducts a blood test for the presence of lead in a child who is under 18 years of age shall . . . submit a report of the results of the test to the appropriate health authority *in accordance with regulations adopted by the State Board of Health*" (emphasis added). However, staff with the Nevada's Department of Health and Human Services, Division of Public and Behavioral Health stated by email on August 31, 2016 that they were not aware of any such regulations, indicating that this is an empty requirement.

**43** *DC*: D.C. Mun. Regs. tit. 22, § B7301.1, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleNumber=22-B7301

*CT*: Conn. Gen. Stat. Sec. 19a-111g, https://www.cga.ct.gov/current/pub/chap_368a.htm#sec_19a-111g; Connecticut Department of Public Health, "Requirements and Guidance for Childhood Lead Screening by Health Care Professionals in Connecticut," Revised April 2013, http://www.ct.gov/dph/lib/dph/environmental_health/lead/pdf/screening_requirements-2016.pdf;

*DE*: 16 Del. C. § 2602(a), http://delcode.delaware.gov/title16/c026/index.shtml

*IA*: Iowa Admin. Code r. 641-67.5, .6, http://idph.iowa.gov/Portals/1/Files/LPP/Chapter.641.67.pdf; Note that Iowa does allow for an exemption from this requirement if the Department of Public Health determines on an individual basis that a child is at very low risk for elevated blood lead levels. *Id.* at 67.4

*LA*: La. Admin. Code tit. 48, § 7005, http://www.doa.la.gov/Pages/osr/LAC-48.aspx (Book 2). This state moved to universal screening in 2008 because screening rates weren't high enough in any parish to provide enough data to figure out which ones were high risk. Lagarde, Gina, "UNIVERSAL Blood Lead Screening of Children under 6 years of Age," Louisiana Childhood Lead Poisoning Prevention Program, October 23, 2008, https://www.lmmis.com/provweb1/children_lead.pdf**.** Note that the rates are still not very high.

*MD*: Md. Code Regs. 10.11.04.02B(2), .04.A, http://www.dsd.state.md.us/comar/SubtitleSearch.aspx?search=10.11.04.*; Maryland Department of Health and Mental Hygiene, "Maryland Targeting Plan for Areas at Risk for Childhood Lead Poisoning," October 2015, http://phpa.dhmh.maryland.gov/IDEHASharedDocuments/MD%202015%20Lead%20Targeting%20Plan.pdf

*MA*: 105 Mass. Code Regs. 460.050, http://www.mass.gov/courts/docs/lawlib/104-105cmr/105cmr460.pdf

*NJ*: N.J. Admin. Code § 8:51A-2.2

*NY*: N.Y. Comp. Codes R. & Regs. tit. X, § 67-1.2, https://www.health.ny.gov/regulations/nycrr/title_10/part_67/#sec67-1-2

*RI*: 23 24.6 PB R.I. Code R. § 3.1(b), http://sos.ri.gov/documents/archives/regdocs/released/pdf/DOH/7741.pdf

*VT*: "Vermont Blood Lead Testing and Reporting Rule, 10-044, http://www.healthvermont.gov/regs/documents/lead_blood_testing_rule.pdf; Vermont Department of Public Health, "Blood Lead Screening Guidelines," accessed October 21, 2016, http://healthvermont.gov/enviro/lead/screening.aspx

**44** We consider Connecticut to require testing around ages 1 and 2 because the testing is required annually from 9 months through 35 months, so it is likely to happen around 1 and 2, and the binding Guidance document says most providers test at 12 and 24 months.

**45** The only universal testing states that do not require additional testing are Iowa and Louisiana. Louisiana does require the administration of a risk assessment, but does not specify whether a test is required or just recommended on a positive answer.

**46** 16-4459A Del. Admin. Code, http://regulations.delaware.gov/AdminCode/title16/Department%20of%20Health%20and%20Social%20Services/Division%20of%20Public%20Health/Health%20Systems%20Protection%20(HSP)/4459A.shtml

**47** Md. Code Regs. 10.11.04.02B(2), .04, http://www.dsd.state.md.us/comar/SubtitleSearch.aspx?search=10.11.04.*

**48** One explanation for a percentage over 100 is that children moved into the state after 2009, so there were more children to be tested than the number born in 2009. Also, staff mentioned that they recently combined a large number of databases into one, and a small amount of duplication still exists.

**49** For sources, see notes under Tables 1.A – 1.D above.

**50** Iowa Admin. Code r. 641-67.5, http://idph.iowa.gov/Portals/1/Files/LPP/Chapter.641.67.pdf

**51** Michigan's requirement only applies to children participating in the special supplemental food program for women, infants, and children (WIC). MO's and WV's requirements are in regulations but state lead program staff did not consistently refer to the policies as requirements. Although Maryland requires targeted screening for children born before 2015, since the state has universal screening for those born in and after 2015, it is not included in this tally.

**52** Staff in the West Virginia Office of Maternal, Child and Family Health, Childhood Lead Poisoning Prevention Program, Personal Communication, June 30, 2016

**53** E.g. – "shall test" in 410 Ill. Comp. Stat. § 45/6.2, http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1523&ChapterID=35 v. "A blood lead test should be performed" in Illinois Department of Public Health, "Childhood Lead Risk Questionnaire," October 2015, http://idph.prod.acquia-sites.com/sites/default/files/forms/childhood-lead-risk-questionaire-and-guidelines-042116.pdf

**54** See Table 1.C for a list of states

**55** See http://www.health.pa.gov/My%20Health/Infant%20and%20Childrens%20Health/Lead%20Poisoning%20Prevention%20and%20Control/Documents/Lead%20Poisoning%20FAQs_042516_FINAL.pdf, accessed from here, under "Quick Links" - http://www.health.pa.gov/My%20Health/Infant%20and%20Childrens%20Health/Lead%20Poisoning%20Prevention%20and%20Control/Pages/default.aspx#.WAmVHZMrKb9 (last visited October 21, 2016)

**56** Available at http://epibulletins.dhss.alaska.gov/Document/Display?DocumentId=70, confirmed in a June 8, 2016 email from staff in the State of Alaska Department of Health and Social Services.

**57** Clark County, referenced here: Southern Nevada Health District, "Reportable Diseases and Conditions," accessed October 21, 2016, https://www.southernnevadahealthdistrict.org/disease-reporting/disease-reporting.php

**58** N.H. Rev. Stat. Ann. § 130-A:5-b, http://www.gencourt.state.nh.us/rsa/html/X/130-A/130-A-5-b.htm

**59** HB 1917 (Session 2015), introduced in the Pennsylvania House of Representatives by Representative Cruz and referred to the Health committee on April 1, 2016, would require universal lead testing in the state and require insurance companies to pay for it, http://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?syear=2015&sind=0&body=H&type=B&bn=1917

**60** South Dakota and Wyoming. South Dakota's website is comprised of laboratory-related and CDC-maintained information (https://doh.sd.gov/lab/medical-microbiology/lead.aspx)

**61** Arkansas Department of Health staff, Telephone interview, Late May/June 2016; Wyoming Department of Health staff, Telephone interview, Late May/June 2016

**62** North Dakota Health Department staff, Telephone interview, June 2016

**63** The only states that did not follow this part of the requirement (but did require tests at 12 and 24 months) were Maine, Mississippi, Nevada, New Mexico, Pennsylvania, Oregon, and Wyoming. New Mexico Medicaid staff confirmed by email that testing after 24 months was based on risk assessment, but the state's lead program website said this testing was required if there was no previous test, without mentioning a risk assessment. New Mexico CLPPP, "Childhood Lead Poisoning Prevention Program," accessed October 21, 2016, https://nmhealth.org/about/erd/eheb/clppp/. South Carolina's Medicaid Provider Manual said children older than 24 months up to 6 years *should* be tested without a record

of a previous test, but staff said the testing in this age period is "needed" where the doctor doesn't know if it was done earlier. South Carolina Department of Health and Human Services staff, Personal communication, July 20, 2016. Kentucky's requirement was unclear. Kentucky Department for Medicaid Services, "EPSDT Screening Services and EPSDT Special Services Policies and Procedures," May 1998, http://www.chfs.ky.gov/NR/rdonlyres/64EFF098-5C67-48B4-8B8B-97EE2E9005BF/0/1034.pdf; See p. 4-10, stating that lead tests are required on positive answers to the risk assessments, but the relevant risk assessment question, on Appendix V, p. 1, is "Has your child ever had a blood lead test?"

**64** See fn32

**65** See fn33

**66** Pennsylvania Department of Human Services staff, Telephone interview, July 26, 2016

**67** Wisconsin Department of Health Services, "2014 Report on Childhood Lead Poisoning in Wisconsin," January 2016, p. 14, https://www.dhs.wisconsin.gov/publications/p01202.pdf

**68** Utah Department of Health, Bureau of Managed Care; Personal communication; July 28, 2016

**69** "Updated Recommendations on Blood Lead Screening for Medicaid-Eligible Children," *State of Alaska Epidemiology Bulletin*, January 21, 2010, http://www.epi.alaska.gov/bulletins/docs/b2010_01.pdf; confirmed to be current policy: Department of Health & Social Services staff, Telephone interview, June 10, 2016

**70** Montana DPHHS, "General Information for Providers," August 2016, p. 3.4 (page updated January 2016), http://medicaidprovider.mt.gov/Portals/68/docs/manuals/General/GeneralManual08012016.pdf

**71** Neb. Admin. Code, ch. 33, § 002.02D.4, http://www.sos.ne.gov/rules-and-regs/regsearch/Rules/Health_and_Human_Services_System/Title-471/Chapter-33.pdf; Neb. Rev. Stat. § 71-2518(1)(a)(ii), http://nebraskalegislature.gov/laws/statutes.php?statute=71-2518

**72** Nebraska Dept. of Health & Human Services staff, Personal communication, October 18, 2016

**73** See fn67, at p. 24. By email dated July 29, 2016, staff said they planned to distribute reports again this year, likely because of renewed grant funding.

**74** Louisiana Healthy Homes and Childhood Lead Poisoning Prevention Program staff, Personal communication, July 25, 2016

**75** New Jersey Department of Health staff: Telephone interview, June 29, 2016 & Personal communication, August 8, 2016

**76** Massachusetts Department of Public Health staff, Telephone interview, June 28, 2016

**77** Connecticut Department of Public Health, Personal communication, July 22, 2016

**78** Rhode Island Department of Health, "Frequently Asked Questions about KIDSNET," January 2011, http://www.health.ri.gov/publications/frequentlyaskedquestions/KIDSNET.pdf

**79** Rhode Island Department of Health, Personal communications, July 7, 2016 & July 21, 2016

**80** Kollett-Almeida, Michelle et al., "CDC Site Visit, June 2016," Rhode Island Department of Health, p. 23.

**81** See fn67, at p. 24

**82** *Id*. at pp. 24-25. As of July 2016, staff planned to distribute reports again this year, likely because of renewed grant funding. Wisconsin Childhood Lead Poisoning Prevention Program staff, Personal communication, July 29, 2016

**83** North Carolina Department of Health and Human Services staff, Personal communication, July 16, 2016

**84** This is not an exhaustive list. State laboratories other than those in Michigan and Rhode Island may charge more or less. Michigan: $11, http://www.michigan.gov/mdhhs/0,5885,7-339-71550_2955_2983-19536--,00.html; Rhode Island: $25, p. G-1, http://sos.ri.gov/documents/archives/regdocs/holding/DOH/MasterFeeSchedule_PublicHearingDraft_September%2016.pdf. The range in the 2015 Maryland Lead Targeting Plan is similar: $14-$25 based on low and high Medicaid reimbursement, p. A-43,

http://phpa.dhmh.maryland.gov/IDEHASharedDocuments/MD%202015%20Lead%20Targeting%20Plan.pdf. Lake County Health Department in Illinois charged up to $43 for a lead test as of 2010. American Academy of Pediatrics Illinois Chapter, "Lead Poisoning Blood Test Locations in Illinois," July 21, 2010, http://illinoisaap.org/2010/07/lead-poisoning-blood-test-locations-in-illinois/. A New Hampshire study reported that a test and venous blood draw averaged $38. Chawla, Chiahui, NH Department of Health and Human Services, "Economic Burden of Environmentally Attributable Illness in Children of New Hampshire," July 2014, p. 20, https://www.nh.gov/epht/documents/nhchildrenreport.pdf

**85** U.S. Department of Health & Human Services Assistant Secretary for Public Affairs, "Preventive Services Covered Under the Affordable Care Act," content last reviewed September 27, 2012, http://www.hhs.gov/healthcare/facts-and-features/fact-sheets/preventive-services-covered-under-aca/

**86** Bright Futures/American Academy of Pediatrics, "Recommendations for Preventive Pediatric Health Care," Footnote 20, https://www.aap.org/en-us/Documents/periodicity_schedule.pdf

**87** See pub. 2 in fn25. For example: this interpretation would likely mean that for children 12 and 24 months old, ACA covers the tests required by Missouri regulations for these children spending over 10 hours in a high-risk area (although Missouri requires tests *annually from 6 months to 72 months* for this population). ACA would also cover the state-required testing on a positive answer to a risk assessment, since the periodicity schedule recommends testing in this situation. Mo. Code Regs. tit. 19, 20-8.030 (3)

**88** *LA*: Lagarde, Gina, "UNIVERSAL Blood Lead Screening of Children under 6 years of Age," Louisiana Childhood Lead Poisoning Prevention Program, October 23, 2008, https://www.lmmis.com/provweb1/children_lead.pdf

*MD*: Maryland Department of Health and Mental Hygiene, "Maryland Targeting Plan for Areas at Risk for Childhood Lead Poisoning," October 2015, p. 1, http://phpa.dhmh.maryland.gov/IDEHASharedDocuments/MD%202015%20Lead%20Targeting%20Plan.pdf

**89** *DE*: 16-4459A, 2.0 Del. Admin. Code (see reference to zip codes), http://regulations.delaware.gov/AdminCode/title16/Department%20of%20Health%20and%20Social%20Services/Division%20of%20Public%20Health/Health%20Systems%20Protection%20(HSP)/4459A.shtml

*MA*: 105 Mass. Code Regs. 460.050(C)(2), http://www.mass.gov/courts/docs/lawlib/104-105cmr/105cmr460.pdf

**90** Kaiser Family Foundation, "2016 Employer Health Benefits Survey," September 14, 2016, http://kff.org/report-section/ehbs-2016-summary-of-findings/

**91** New Jersey Department of Health staff, Telephone interview, June 29, 2016

**92** Chen MD, Harry, "Lead Poisoning Prevention: Report on 2015 Program Outcomes and Activities," April 15, 2016, p. 11, http://legislature.vermont.gov/assets/Legislative-Reports/Lead-Poisoning-Prevention-4.15.16.pdf; Idaho Department of Health and Welfare, "Idaho Medicaid Lead Testing Program," accessed October 21, 2016, http://healthandwelfare.idaho.gov/Medical/Medicaid/MedicalCare/LeadTestingProgram/tabid/692/Default.aspx

**93** New Jersey Department of Health, Personal communication, August 8, 2016

**94** Pennsylvania may require this in the future. Pennsylvania Department of Health, Personal communication, June 30, 2016

**95** *DC*: D.C. Code § 38-602(a-1), https://beta.code.dccouncil.us/dc/council/code/sections/38-602.html

*DE*: 16 Del. C. § 2603, http://delcode.delaware.gov/title16/c026/index.shtml

*IA*: Iowa's universal testing requirement is that children entering kindergarten be tested – Iowa Admin. Code r. 641-67.5, .6, http://idph.iowa.gov/Portals/1/Files/LPP/Chapter.641.67.pdf

*IL*: 410 Ill. Comp. Stat. § 45/7.1, http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1523&ChapterID=35

*MD*: Md. Code Regs. 10.11.04.05, 10.11.02.B(17)(b), http://www.dsd.state.md.us/comar/SubtitleSearch.aspx?search=10.11.04.*, Maryland Code Family Law Article 5-556.1, http://mgaleg.maryland.gov/webmga/frmStatutesText.aspx?article=gfl&section=5-556.1&ext=html&session=2015RS&tab=subject5

*MA*: 105 Mass. Code Regs. 460.050(E), http://www.mass.gov/courts/docs/lawlib/104-105cmr/105cmr460.pdf

*MO*: Mo. Code Regs. tit. 19, 20-8.030 (9), http://s1.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-8.pdf

*NY*: N.Y. Comp. Codes R. & Regs. tit. X, § 67-1.4, https://www.health.ny.gov/regulations/nycrr/title_10/part_67/#sec67-1-4

*RI*: 23 24.6 PB R.I. Code R. § 3.1(d), http://sos.ri.gov/documents/archives/regdocs/released/pdf/DOH/7741.pdf

**96** Meriden and Waterbury, according to a July 22, 2016 email from staff in the Connecticut Department of Public Health. California's school entry health exam report, required for first grade, includes a spot for a lead test. However, state staff via email on July 21, 2016 said this was not a "specific requirement."

**97** Delaware Health and Social Services Department Division of Public Health, "Frequently Asked Questions: Regulations Governing the Childhood Lead Poisoning Prevention Act for Children Between the Ages of 22 and 26 Months," accessed November 4, 2016, answer to question 3, http://www.dhss.delaware.gov/dhss/dph/hsp/files/olppscreenfaq.pdf; Meriden, Connecticut Health Department staff, Telephone interview, July 2016; Waterbury, Connecticut Health Department staff, Telephone interview, July 2016

**98** NY Department of Health, "What Child Care Providers Need to Know About Lead," July 2009, https://www.health.ny.gov/publications/2517.pdf

**99** DC Office of the State Superintendent of Education Staff, Telephone interview, August 1, 2016

**100** Iowa Department of Public Health staff, Personal communications, July 1, 2016 and July 7, 2016

**101** Meriden, CT Health Department staff, Telephone interview, July 2016

**102** Delaware Lead Poisoning Prevention Program staff, Personal communication via Freedom of Information Act, August 5, 2016

**103** Cal Health & Safety Code § 105305: "The program implemented pursuant to this chapter shall be fully supported from the [Childhood Lead Poisoning Prevention] fees," http://www.leginfo.ca.gov/cgi-bin/displaycode?section=hsc&group=105001-106000&file=105275-105310; California State Board of Equalization, "Childhood Lead Poisoning Prevention Fee," accessed October 21, 2016, https://www.boe.ca.gov/sptaxprog/childhood_lead_poison_prev_fee.htm

**104** California State Board of Equalization, "Childhood Lead Poisoning Prevention Fee – FAQs," accessed October 21, 2016, https://www.boe.ca.gov/sptaxprog/childhood_lead_poison_prev_fee_faq.htm

**105** E.g.: Minnesota's screening guidelines (recommendations) have been endorsed by major medical groups. Minnesota Department of Health, "Guidelines," accessed October 21, 2016, http://www.health.state.mn.us/divs/eh/lead/guidelines/#protect

**106** This total includes Alabama, where it is *likely* that doctors ask questions to determine risk of lead exposure before testing. Frostenson, Sarah, "America does a terrible job tracking how many kids have lead poisoning," *Vox*, February 5, 2016. Current staff could not comment. This total did not include states where the use of questionnaires was optional.

**107** These questions are based on the Arizona, Nebraska, and Oregon questionnaires

**108** Cal. Code Regs. tit. 17, § 37020, 37100, http://www.cdph.ca.gov/programs/CLPPB/Pages/CACodeofRegsfull-CLPPB.aspx

**109** Nevada Department of Health and Human Services staff, Telephone interview, July 19, 2016

**110** See pub. 1 in fn 23, at p. 19-20

**111** Schwab, Lea T., et al., "Inaccuracy in Parental Reporting of the Age of Their Home for Lead-Screening Purposes," *Arch Pediatr Adolesc Med*. 2003;157(6):584-586. doi:10.1001/archpedi.157.6.584, http://jamanetwork.com/journals/jamapediatrics/fullarticle/481353

**112** Dyal, Brenda, "Are lead risk questionnaires adequate predictors of blood lead levels in children?," *Public Health Nursing*, 2012 Jan-Feb;29(1):3-10, p. 6 and Table 3, http://www.ncbi.nlm.nih.gov/pubmed/22211746. Limitations of the Dyal study included the small sample size (69 children) and not knowing where the questionnaire was administered (e.g. pediatrician's office or Head Start program) or by whom.

**113** The study also briefly discussed shortcomings with the other common method of detecting lead exposure, zip code mapping. This method doesn't account for people moving around and using imported toys or other items.

**114** An exception is Illinois: staff can check school records to see if questionnaires were administered but it's unclear how often they do this. IL Department of Public Health Staff, Personal communication, July 1, 2016

**115** Md. Code Regs. 10.11.04.02 & .04, http://www.dsd.state.md.us/comar/SubtitleSearch.aspx?search=10.11.04.*; Maryland Department of Health and Mental Hygiene, "Maryland Targeting Plan for Areas at Risk for Childhood Lead Poisoning," October 2015, http://phpa.dhmh.maryland.gov/IDEHASharedDocuments/MD%202015%20Lead%20Targeting%20Plan.pdf; See also: Maryland Department of Health and Mental Hygiene, "What is new in Lead Poisoning prevention in Maryland?" accessed October 21, 2016, http://phpa.dhmh.maryland.gov/OEhfp/eh/Pages/Lead.aspx

**116** See pub. 2 in fn115 at page 3

**117** *Id*. at Table 2 and Appendix 5

**118** *Id*. at p. 9

**119** MD DHMH estimated the cost of universal testing, follow-up testing for those with elevated levels, and further actions including home inspections for children with levels at or above 10 µg/dL as between $3.9 million and 5.9 million. This range reflects the potentially different cost per test, ranging from about $14 for a capillary test to $25 for a venous test. *Id*. at Tables A-5.1 and A-5.4, and p. A-50.

**120** *Id*. at p. 10.

**121** Ibid. The costs of long-term health effects and behavioral problems like osteoporosis and ADHD are assumed to be high, but are difficult to quantify at this time so are not included. The range in the estimate is due to different assumptions for how much BLLs impact IQ levels. Intangible costs of crime (suffered by victims) are included only in the upper limit. *Id*. at p. A-68, A-71 and A-72

**122** *Id*. at p. A-72

**123** At visits where testing is already required, risk assessments are important for identifying specific sources of lead exposure. Maryland requires doctors to administer the risk assessment to decide whether to test children at visits other than the 12- and 24-month visits if they were born on or after January 1, 2015 or born before 2015 but have lived in an at-risk area as defined in the 2004 state targeting plan. *Id*. at Appendix 1. For children who were born before 2015 and live outside 2004-designated at-risk areas, the state still requires risk assessments at the 24-month visit to determine whether any testing is indicated. Md. Code Regs. 10.11.04.03

# APPENDIX: EXAMPLE OF STATE RISK ASSESSMENT

Revised 01/2015

# Blood Lead Testing Requirements
## for Ohio Children less than 6 Years of Age

Ohio Department of Health
Ohio Healthy Homes and Lead Poisoning Prevention Program • www.odh.ohio.gov

Ohio Healthy Homes

## There is no safe level of lead in the blood.

- All capillary (finger/heel stick) test results ≥ 5 μg/dL must be confirmed by venous draw. Point of care instruments such as the LeadCare® II cannot be used to confirm an elevated blood lead level, even if the sample is collected by venipuncture.
- Any confirmed level of lead in the blood is a reliable indicator that the child has been exposed to lead.
- All blood lead test results, by law, are required to be reported to ODH by the analyzing laboratory.
- The Ohio Healthy Homes and Lead Poisoning Prevention Program will respond accordingly to all blood lead levels of 5 μg/dL or greater.

| *If the family answers **"yes"** or **"do not know"** to ANY of the questions below then* **TEST—*IT'S OHIO LAW!*** *If the family answers **"no"** to all questions, provide prevention guidance and follow up at the next visit.* | **YES** | **DO NOT KNOW** | NO |
|---|---|---|---|
| **1. Does the child live in or regularly visit a property built before 1978 that has peeling/chipping paint or recent/ongoing renovation? This includes childcare centers, preschools, or homes of a babysitter or relative.** *If **"yes"** or **"do not know,"*** **TEST—*IT'S OHIO LAW!*** If ***"no,"*** go to 2. | ☐ | ☐ | ☐ |
| **2. Is the child on Medicaid?** *If **"yes"*** **at Ages 1 and 2,** **TEST—*IT'S OHIO LAW!*** *If **"yes"*** **and the child is between 3-6 Years of age,** **TEST IF THE CHILD HAS NO TEST HISTORY, regardless of risk factors.** If ***"no,"*** go to 3. | ☐ | ☐ | ☐ |
| **3. Does the child live in a high risk ZIP code?** (See list on back.) *If **"yes,"*** **TEST—*IT'S OHIO LAW!*** If ***"no,"*** go to 4. | ☐ | ☐ | ☐ |
| **4. Ask the parent six key questions to assess risk.** *If **"yes"** or **"do not know"** to ANY of the questions,* **TEST—*IT'S OHIO LAW!*** | | | |
| • Does your child live in or regularly visit a home built before 1950? | ☐ | ☐ | ☐ |
| • Does your child have a sibling or playmate who has or did have lead poisoning? | ☐ | ☐ | ☐ |
| • Does your child frequently come in contact with an adult who has a hobby or works with lead? Examples are construction, welding, pottery, painting, and casting ammunition. | ☐ | ☐ | ☐ |
| • Did the child's mother have known lead exposure during her pregnancy with the child? | ☐ | ☐ | ☐ |
| • Is the child or his/her mother an immigrant or refugee? | ☐ | ☐ | ☐ |
| • Does your child live near an active or former lead smelter, battery recycling plant, or other industry known to release lead? | ☐ | ☐ | ☐ |