

Mississippi Lead Poisoning Prevention
and Healthy Homes Program (LPPHHP)

**Childhood Lead Surveillance
2017-2021 Snapshot**

Mississippi State Department of Health

2017-2021 Blood Lead Surveillance Snapshot

Prepared By:

Crystal Veazey
MSLPPHHP Director

Stacy Callender
Director, Office of Child and Adolescent Health

James Kelley
MSLPPHHP Epidemiologist

Ellen Agho, DrPH, MPH, CHP
Director, Health Services Epidemiology and Biostatistics

Beryl Polk, PhD, CPM, CHP, CCM
Director, Health Services

Acknowledgements

The information contained in this report is compiled by the Mississippi State Department of Health (MSDH). Thanks to the providers, hospitals, local health department staff, directors of laboratories, and medical professionals who perform blood lead analyses and evaluate, diagnose, and treat lead-poisoned children in Mississippi.

This publication was made possible in part by grant agreement number 1NUE2EH001427-01-00 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

Copyright information

All material in this report is in the public domain and may be reproduced or copied without permission; citation as to source, however, is appreciated. The MSDH and the Mississippi Lead Poisoning Prevention and Healthy Homes Program make the annual surveillance data available as a public service. Use of this data does not constitute an endorsement by the MSDH of the user's opinion or conclusions, and none should be inferred.

Accessibility

2017-2021 Blood Lead Surveillance Snapshot

Upon request, this material will be made available in an alternative format, such as large print, Braille, or audio recording.

TABLE OF CONTENTS

List of Figures 4

List of Tables 4

Acronyms and Abbreviations 5

Executive Summary 6

Lead: An Environmental Hazard for Health..... 7

 Lead Poisoning..... 7

 Sources of Lead..... 7

 Elevated Blood Lead Levels 7

Lead Poisoning Prevention and Healthy Homes 8

 State Blood Lead Screening and Treatment Guidelines 8

 Lead Poisoning Prevention and Healthy Homes Screening Plan 8

 Lead Poisoning Prevention and Healthy Homes Care Coordination Plan..... 9

 Surveillance..... 9

 Environmental Risk Assessments 10

Statewide Surveillance Data 12

Strategies to Increase EBLL Identification and Prevent Lead Exposure in Children..... 18

2017-2021 Blood Lead Surveillance Snapshot

LIST OF FIGURES

Figure 1: Dwellings Inspected for Lead, 2017-2021	10
Figure 2: Number and Percentage of Mississippi Children Tested, 2017-2021.....	12
Figure 3: Percentage of Mississippi Children Tested by Age, 2017-2021	13
Figure 4: Proportion of Mississippi Children Tested by Age, 2017-2021	13
Figure 5: State and National Lead Testing Rates, 2017-2018.....	14
Figure 6: Percentage of Mississippi Children with an EBLL, 2017-2021	15
Figure 7: Number of Mississippi Children in the EBLL Ranges, 2017-2021	16
Figure 8: Percentage of Mississippi Children with an EBLL by Sex, 2017-2021	17
Figure 9: Percentage of Mississippi Children with an EBLL by Age in Years, 2017-2021	17
Figure 10: Percentage of Mississippi Children with an EBLL by Medicaid Status, 2017-2021 ..	18

LIST OF TABLES

Table 1: Supports Offered to Families by the MSLPPHHP Based on Identified EBLL.	9
Table 2: Lead Hazards Detected During Investigations of Children with EBLL, 2017-2021 ...	11
Table 3: Number and Percentage of Mississippi Children Tested, 2017-2021.....	12
Table 4: Percentage of Mississippi Children Tested by Age, 2017-2021	13
Table 5: State and National Lead Testing Counts and Percentages, 2017-2018	14
Table 6: Number and Percentage of Mississippi Children with an EBLL, 2017-2021	15
Table 7: Number of Mississippi Children in the EBLL Ranges, 2017-2021	16
Table 8: Number of Mississippi Children Tested and Number and Percentage of Mississippi Children with an EBLL by Sex, 2017-2021	16
Table 9: Number of Mississippi Children Tested and Number and Percentage of Mississippi Children with an EBLL by Age in Years, 2017-2021	17
Table 10: Number of Mississippi Children Tested and Number and Percentage of Mississippi Children with an EBLL by Medicaid Status, 2017-2021	18

2017-2021 Blood Lead Surveillance Snapshot

ACRONYMS AND ABBREVIATIONS

µg/dL	Micrograms of lead per deciliter of whole blood
AAP	American Academy of Pediatrics
BLL	Blood Lead Level
CDC	Centers for Disease Control and Prevention
CYSHCN	Children and Youth with Special Health Care Needs
EBLL	Elevated Blood Lead Level
EI	Early Intervention
EPSDT	Early and Periodic Screening, Diagnosis and Treatment
HHLPS	Healthy Housing Lead Poisoning Surveillance System
HL7	Health Level Seven
LPPHP	Lead Poisoning Prevention and Healthy Homes Program
MSDH	Mississippi State Department of Health
MSLPPHP	Mississippi Lead Poisoning Prevention and Healthy Homes Program
RHA	Rural Health Association

2017-2021 Blood Lead Surveillance Snapshot

EXECUTIVE SUMMARY

This report describes the activities of the Mississippi State Department of Health (MSDH) Lead Poisoning Prevention and Healthy Homes Program (LPPHHP) and the data analysis from the MSDH Healthy Housing Lead Poisoning Surveillance System (HHLPSS) for the 2017-2021 calendar years. This report contains a description of the trends in lead testing and elevated blood lead levels in Mississippi during 2017-2021.

Lead exposure surveillance through the HHLPSS enables the identification of lead exposures and responses to lead exposures, as well as monitoring of trends and patterns in the population. MSDH currently receives funding from the Centers for Disease Control and Prevention (CDC) to support surveillance and primary prevention activities.

During 2017-2021, 164,980 (64%) of the 258,074 Mississippi children under 72 months of age received at least one capillary or venous blood lead test. Of these, 845 were found to have an elevated blood lead level (EBLL), defined as at least one venous blood lead level test with a result of ≥ 5 $\mu\text{g}/\text{dL}$.¹ The percentage of tested children with a confirmed EBLL decreased from 2017 to 2019 but increased again in 2020 and 2021. Due to the ongoing health emergency related to COVID-19, far fewer children were tested for lead in 2020-2021 overall. The proportion of children who are tested and identified with an EBLL varies across populations and geographic areas in Mississippi.

CDC recommends a venous sample be taken after any capillary lead level ≥ 5 $\mu\text{g}/\text{dL}$ ² as venous results are more reliable and valid.³ LPPHHP services are provided to families of children with a confirmed venous EBLL. Families of children who do not receive a confirmatory venous test will be notified of the importance of the confirmatory venous test to confirm the EBLL. If the family refuses the confirmatory venous test, no program services are provided.

Families of children with a confirmatory test of ≥ 5 $\mu\text{g}/\text{dL}$ are provided care coordination services by LPPHHP, including telephone counseling and educational mailings. Families of children with a confirmatory test of ≥ 10 $\mu\text{g}/\text{dL}$ are also referred to the Early Intervention (EI) and/or Children and Youth with Special Health Care Needs (CYSHCN) programs. Families of children with a confirmatory test of ≥ 15 $\mu\text{g}/\text{dL}$ are also provided a home visit and environmental assessment of the child's primary address or any address where the child spends at least six hours a week. During the assessment, lead-based paint hazards and other lead sources are identified, and low-cost recommendations are provided to the family to reduce the child's exposure to lead. These recommendations may include cleaning techniques, such as wet mopping floors and steps or wiping down windowsills, and covering areas with chipping or peeling paint with contact paper, tape, or plastic.

¹ The 845 tests do not represent unique numbers of children as any children with an EBLL counted in one year was counted again in any subsequent year if they tested positive again.

² In October 2021, the CDC recommended this level be lowered to >3.5 $\mu\text{g}/\text{dL}$.

³ As capillary samples have a greater chance of contamination, they have higher false positive rates than venous tests. Also, during this time frame, some lead test kits used to analyze capillary blood samples had higher false negative rates than venous tests.

LEAD: AN ENVIRONMENTAL HAZARD FOR HEALTH

Lead Poisoning

Lead poisoning is one of the most common yet preventable environmental health problems in young children. Lead is a naturally occurring metal that can be breathed in, swallowed, or absorbed through particles. Once inside the body, lead can be stored in bones, blood, and other tissues. Ongoing exposure or exposure to high levels of lead over a short period of time can cause lead poisoning, resulting in pain, nausea, weakness, tiredness, irritability, memory loss, organ and brain damage, and even death.

Children less than six years of age are the most vulnerable to lead poisoning as they are more likely to be exposed to lead and absorb lead more easily than older children. Further, it is more harmful to them due to their developing brains. Even low levels of exposure during the first years of life can be detrimental to a child's growth, leading to developmental delays and problems with learning, hearing, and speech. The symptoms of lead exposure in very young children may initially be subtle and easily overlooked until dangerous amounts of lead have accumulated. The long-term impacts of lead exposure may become more apparent when the child starts school, and they experience increased behavioral and learning demands. Lead exposure puts children at increased risk of educational failure, adjustment issues, and poorer health and well-being.

Sources of Lead

There are many sources of lead in the environment, such as lead dust accidentally brought home from workplaces and hobby areas, lead in plumbing, lead in the soil from years of contamination, and some imported products and traditional remedies. The most common source of lead poisoning in small children is deteriorated lead-based paint in homes and the lead dust associated with these paints. Even though lead-based paint was banned for use in residential dwellings in 1978, many homes still contain these paints, especially if built before 1960.

Elevated Blood Lead Levels

As lead poisoning may not result in noticeable symptoms, the Centers for Disease Control and Prevention (CDC) recommends testing children for lead exposure. Lead testing may occur during routine wellness checks. The best method for determining lead exposure is by taking a blood sample to measure the amount of lead by volume. Although screening may be conducted with a finger-prick or heel-prick (capillary test), confirmatory testing must be conducted by drawing a sample from the child's vein (venous test).

Until October 2021, the CDC defined an elevated blood lead level (EBLL) for a child as ≥ 5 $\mu\text{g}/\text{dL}$.⁴ Although there is no known safe level of lead exposure, the current "reference value" of 3.5 $\mu\text{g}/\text{dL}$ identifies children with higher blood lead levels (BLLs) than 97.5 % of children, based on a survey of blood lead distribution among U.S. children ages 1-5 years in 2015-2016 and 2017-2018. Children with a BLL of ≥ 3.5 $\mu\text{g}/\text{dL}$ represent the top 2.5% of children with the highest BLL.

⁴ In October 2021, the CDC dropped the reference value to 3.5 $\mu\text{g}/\text{dL}$. Mississippi implemented this standard in March 2022.

LEAD POISONING PREVENTION AND HEALTHY HOMES

The Mississippi State Department of Health (MSDH) Lead Poisoning Prevention and Healthy Homes Program (LPPHHP) was established as a result of federal law (42 U.S.C. at 1936a) requiring states to screen children enrolled in Medicaid for an EBLL as a part of prevention services provided through the Early and Periodic Screening, Diagnosis and Treatment Program (EPSDT). The MSLPPHHP's mission is to help eliminate lead exposure and its negative impacts on children in Mississippi. The MSLPPHHP, with support from the CDC, conducts passive surveillance of lead poisoning by tracking BLL for children from birth to six years of age as reported from health care providers across the state.⁵ The MSLPPHHP also provides graduated levels of support for families of children with a confirmed EBLL, including education, telephone counseling, home visits, environmental assessments, and referrals to environmental and health services.

As the effects of lead exposure are irreversible, primary prevention of lead exposure before it starts is crucial. The MSLPPHHP works to develop sustainable partnerships to help implement environmental policies, coordinate program activities to foster healthy and safe homes, and reduce health disparities among Mississippians.

State Blood Lead Screening and Treatment Guidelines

As of June 1, 2017, MSLPPHHP has issued two guidance documents: *Lead Poisoning Prevention and Healthy Homes: Screening Plan* and *Lead Poisoning Prevention and Healthy Homes: Care Coordination Plan*. These documents were developed to guide providers on the evaluation and treatment of children with an EBLL and can be found on the MSDH website (<https://www.msdh.ms.gov/>).

Lead Poisoning Prevention and Healthy Homes Screening Plan

The MSDH Screening Plan was developed to provide guidance to healthcare providers on when to **assess and screen** children less than 72 months of age for lead toxicity. In Mississippi, universal blood lead testing is required for all children on Medicaid as part of EPSDT screening at 12 and 24 months of age and when indicated based on risk assessments for lead toxicity between 6 and 72 months. The American Academy of Pediatrics (AAP) also recommends universal blood lead testing as part of the Bright Futures Preventive Pediatric Care Risk-Based Screening at 12 and 24 months of age in high-prevalence locations, high-risk populations, or as mandated by the state statute.

MSDH recommends healthcare providers use the *Blood Lead Screening and Healthy Homes Summary*, a risk assessment and healthy homes questionnaire, to determine if a child is at high risk for lead exposure. This assessment tool is provided in the three languages:

- English: https://msdh.ms.gov/msdhsite/_static/resources/2270.pdf

⁵ The MSLPPHHP conducts passive surveillance whereby the program receives blood lead level reports submitted by hospitals, clinics, public health units and other sources, as required by the Reportable Disease and Conditions List. The program doesn't conduct active surveillance, which would require the program to initiate data collection from health care providers and laboratories.

2017-2021 Blood Lead Surveillance Snapshot

- Spanish: https://msdh.ms.gov/msdhsite/_static/resources/6742.pdf
- Vietnamese: https://msdh.ms.gov/msdhsite/_static/resources/7147.pdf

Lead Poisoning Prevention and Healthy Homes Care Coordination Plan

The MSDH Care Coordination Plan was developed to provide guidance to MSDH personnel and healthcare providers on how to **monitor and treat** children with EBLs, including the provision of care coordination when a child had a confirmed venous BLL ≥ 5 $\mu\text{g/dL}$.⁶

The plan of action for an EBL child includes all test results, phone counseling, referrals, home visits, and environmental investigations to identify sources of lead. According to this plan, health care providers will provide ongoing monitoring and guidance on methods to reduce BLL. Also, the plan details how the LPPHHP Care Coordinator will coordinate, facilitate, and evaluate the best care options to take the necessary steps to protect the child from further lead exposure.

Table 1: Supports Offered to Families by the MSLPPHHP Based on Identified EBL.

EBLL	MSLPPHHP Support
5-9 $\mu\text{g/dL}$ ⁷	<ul style="list-style-type: none"> • Telephone counseling on lead sources and methods to prevent exposure • Educational materials provided through the mail
10-19 $\mu\text{g/dL}$	<ul style="list-style-type: none"> • Telephone counseling on lead sources and methods to prevent exposure • Educational materials provided through the mail • Referral for early intervention
20-44 $\mu\text{g/dL}$	<ul style="list-style-type: none"> • Telephone counseling on lead sources and methods to prevent exposure • Home visit and environmental assessment • Referral for early intervention
≥ 45 $\mu\text{g/dL}$	<ul style="list-style-type: none"> • Telephone counseling on lead sources and methods to prevent exposure • Home visit and environmental assessment • Referral to early intervention • Referral to toxicologist

Surveillance

Blood lead poisoning is considered a Class II and a Class III reportable disease based on the MSDH *List of Reportable Diseases and Conditions*. Between 2017 and 2021, all blood lead results in patients less than 72 months of age were required to be reported to the MSLPPHHP within **one week** of completion of laboratory tests. Also, during this same time frame, all venous blood lead results ≥ 5 $\mu\text{g/dL}$ were to be reported to the MSLPPHHP as a confirmed EBL within **one week** of diagnosis.

The MSDH maintains the Healthy Housing Lead Poisoning Surveillance System (HHLPSS) for tracking and monitoring trends in BLL for children in Mississippi less than 72 months of age. This database is a CDC-provided web-based system to capture information on care coordination, environmental assessments, and referrals made to internal and external programs. This system

⁶ This guidance was amended when Mississippi implemented the ≥ 3.5 $\mu\text{g/dL}$ standard in March 2022.

⁷ Supports after March 2022 are provided to families of children with an EBL of ≥ 3.5 $\mu\text{g/dL}$.

2017-2021 Blood Lead Surveillance Snapshot

allows for electronic submission of Health Level Seven (HL7) messages from hospitals and reference laboratories.

These data are used to identify populations and geographic areas at high risk for lead poisoning, so the MSLPPHHP can ensure environmental and medical follow-up are provided to children with EBLs and provide targeted prevention activities.

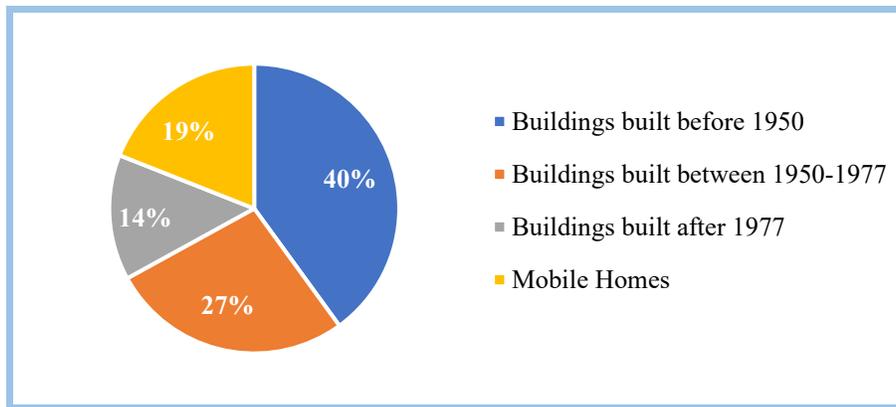
Environmental Risk Assessments

Between 2017 and 2021, the MSLPPHHP identified 127 children ages six (6) years or younger with at least one venous blood lead level of 15 µg/dL who were eligible for an environmental investigation. Of these, the MSLPPHHP provided environmental lead investigations for 68 eligible children at 78 dwellings between 2017 and 2021. Outside-only inspections were performed at a secondary address for one child and at a primary address for another child.

Of the 68 children who received environmental investigations, the majority lived in or frequented⁸ older permanent structures. Forty-seven (47) or 69% of the children lived in or frequented dwellings built before 1978, and 30 or 44% of them lived in or frequented dwellings built before 1950. The majority of the 52 children with EBL were exposed to lead in their primary residences. Sixty-three (63) or 81% of the dwellings inspected were the primary residences of the 52 EBL children, and an additional 15 or 19% were secondary addresses for the children.⁹ For three (3) children, limited or no lead hazards were detected in dwellings, neither the primary nor secondary, frequented by the children. In two (2) of these cases, the probable location for the lead exposure was an out-of-state dwelling.

Of the 78 dwellings inspected, 31 (40%) were built before 1950, 21 (27%) were built between 1950 and 1977, 11 (14%) were built after 1977, and 15 (19%) were mobile homes.¹⁰

Figure 1: Dwellings Inspected for Lead, 2017-2021.



⁸ Buildings were deemed as “frequented” if the child spent six (6) or more hours per week in the structure.

⁹ For one child, the primary residence was located in Louisiana, so only the secondary residence was available for inspection. At the secondary residence, the only lead hazards detected were electrical cords. The source of the child’s EBL was suspected to be either the primary residence or a different location. For another child, a secondary residence was the only dwelling available for inspection. Significant lead hazards were found at that residence.

¹⁰ Age of construction was not obtained for any of the mobile homes.

2017-2021 Blood Lead Surveillance Snapshot

Environmental investigations include the routine testing of dwellings for the following items or areas for potential sources of lead exposure: paint, dust, soil, water, plastic miniblinds, ceramic tubs and sinks, ceramic tile, painted metal furniture, and vinyl floors. In 2018, the MSLPPHP added routine testing of leather and vinyl furniture. Other items are tested for lead only if there is evidence of ingestion or mouthing by the child or physical contact with the child, or they are food or water consumed by the child.

Between 2017 and 2021, multiple lead hazards were detected in the environments of most of the children. The following table shows the lead hazards detected during environmental investigations for EBLL children and, for each hazard, the total number and percentage of those children frequenting a dwelling with that hazard.

Table 2: Lead Hazards Detected During Investigations of Children with EBLL, 2017-2021.

Number	Percent	Hazard Detected ¹¹
34 children	50%	Paint and lead dust associated with paint
24 children	35%	Occupational dust ¹²
26 children	38%	Dust from other sources (plastic blinds, ceramic tile, leather/ vinyl furniture, vinyl floors, old wooden furniture, gun cabinet and trunks, and stain on interior building components)
28 children	41%	Ceramic tile (floors and walls), sinks, tubs, and other fixtures
13 children	19%	Plastic miniblinds
15 children	22%	Vinyl or leather furniture and throw pillows
16 children	24%	Vinyl floors and counters
11 children	16%	Vinyl electrical cords
7 children	10%	Soil
9 children	13%	Toys (plastic, painted metal, rubber ball)
7 children	10%	Ceramic items (including bowl used as sink)
5 children	7%	Painted metal furniture and stand
7 children (6 dwellings)	10%	Vinyl or rubber mats
4 children (2 dwellings)	6%	Plastic beads
2 children	3%	Artificial grass carpet
2 children	3%	Vinyl part of garden hose
2 children	3%	Herbs and spices
2 children	3%	Vinyl or rubber sandals
6 children (5 dwellings)	9%	Old wooden furniture or trunks
6 children (8 dwellings)	9%	Plastic items (cooler, crate, ashtray stand, bucket)
2 children	3%	Vinyl or leather wallets or purses
2 children	3%	Water

¹¹ Other lead hazards detected included old varnish or stain on interior building components, painted metal nozzle of garden hose, fire hydrant, vinyl waistband and ayurvedic medicine. Each of these hazards was detected in or near only one dwelling and in the environmental investigation for only one child.

¹² Five children at five dwellings had lead exposure linked to a household member's employment at an ammunition manufacturing plant.

2017-2021 Blood Lead Surveillance Snapshot

STATEWIDE SURVEILLANCE DATA

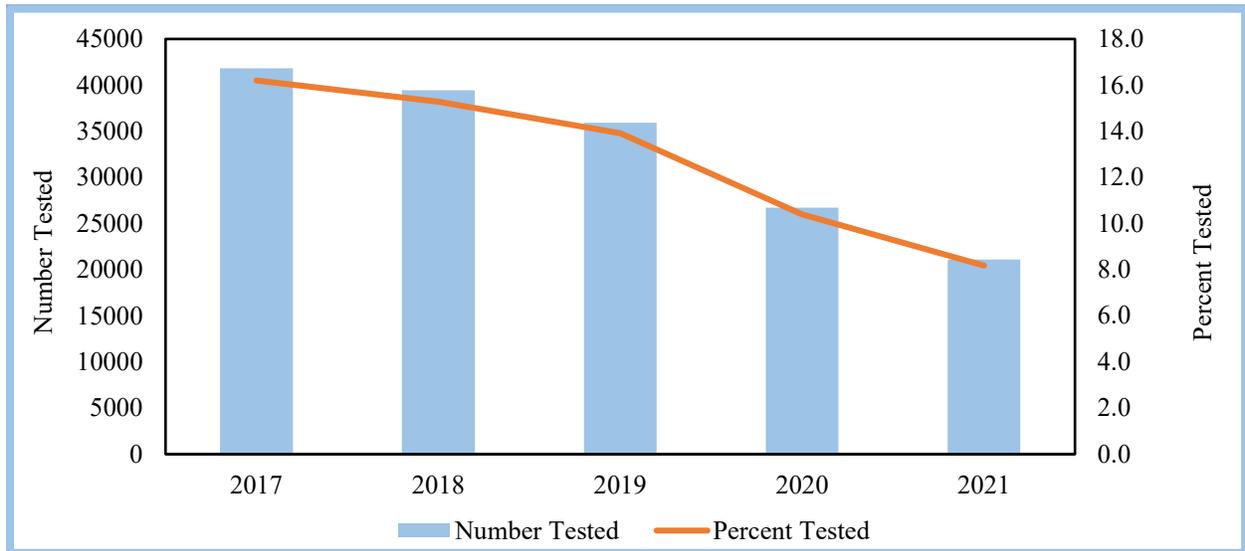
Clinical laboratories in Mississippi that perform blood analysis to detect or determine levels of lead in a child less than 72 months are required to report all BLL screening data and any confirmed EBLL to the Mississippi State Department of Health (MSDH) Lead Poisoning Prevention and Health Homes Program (LPPHHP) according to the *Rules and Regulations Governing Reportable Diseases and Conditions*. Data reported to the LPPHHP are entered into the Mississippi Healthy Housing Lead Poisoning Surveillance System (HHLPSS) via electronic HL7 as well as through manual data entry by program personnel from reports submitted via telephone calls, facsimiles, and mail. HHLPSS data as well as data from national sources were analyzed for this report. Only children aged less than 72 months were included in the analysis for this report.¹³

Between 2017-2021, 164,980 children under six (6) years of age received either a capillary or venous test for blood lead levels. The numbers and percentages of children tested decreased each year from a high of 41,811 (16.2%) to a low of 21,097 (8.2%), with a noted decrease in 2020 and 2021. Over the five-year reporting period, an average of 32,996 (12.8%) of children were tested.

Table 3: Number and Percentage of Mississippi Children Tested, 2017-2021.

	2017	2018	2019	2020	2021	Average
Number of Children Tested, <6 Yrs	41,811	39,433	35,918	26,721	21,097	32,996
Population < 6 Years ¹⁴	258,074	258,074	258,074	258,074	258,074	258,074
Percentage of Children Tested, < 6	16.2%	15.3%	13.9%	10.4%	8.2%	12.8%

Figure 2: Number and Percentage of Mississippi Children Tested, 2017-2021



¹³ Age of the child is calculated based on the child's date of birth and the date of blood draw.

¹⁴ U.S. Census population data for children less than six years old was not available by individual year. An average number was calculated for reference.

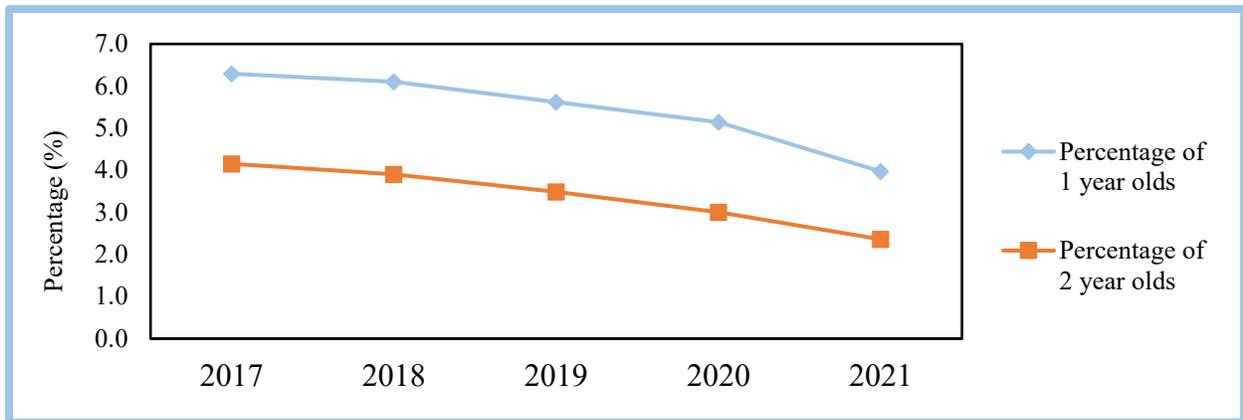
2017-2021 Blood Lead Surveillance Snapshot

Children enrolled in Medicaid are required to be screened for blood lead at 12 and 24 months of age. Children may also be tested at other ages based on risk screenings or between 36-72 months when a test was not conducted at 12 or 24 months of age. When disaggregating the children tested by age, the same declining trends were noted across all ages tested.

Table 4: Percentage of Mississippi Children Tested by Age, 2017-2021.

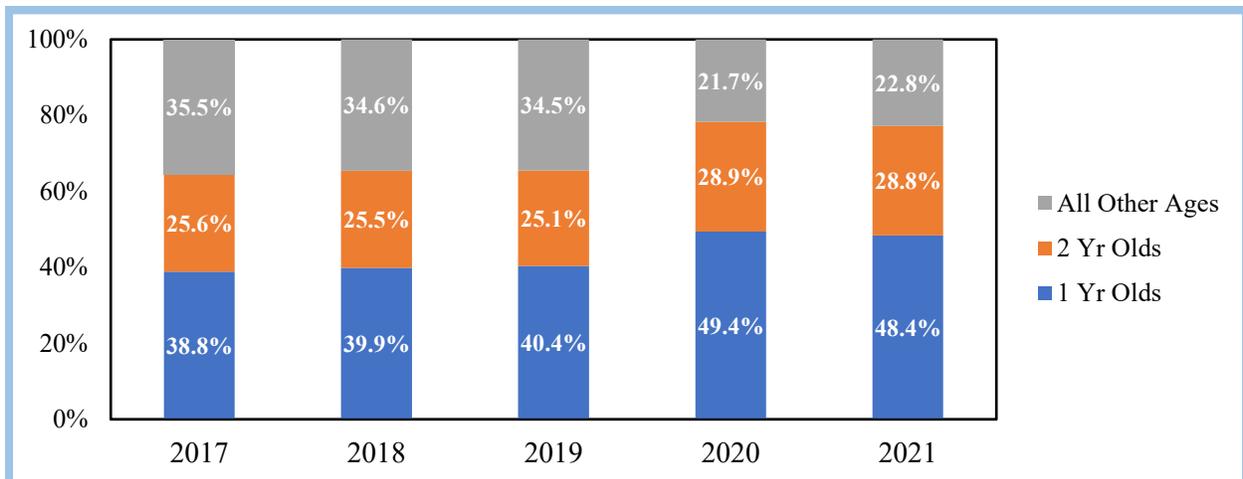
	2017	2018	2019	2020	2021
Percentage of Children Tested - 1 Year Olds	6.3%	6.1%	5.6%	5.1%	4.0%
Percentage of Children Tested - 2 Years Old	4.2%	3.9%	3.5%	3.0%	2.4%
Percentage of Children Tested - Other Ages	5.8%	5.3%	4.8%	2.3%	1.9%
Total Percentage of Children < 6 Tested	16.2%	15.3%	13.9%	10.4%	8.2%

Figure 3: Percentage of Mississippi Children Tested by Age, 2017-2021



Of note, when examining the breakdown of children with either a capillary or venous BLL test by age, children who were one-year old made up the largest proportion of the children tested. Combined, children who were one- and two-years old, i.e., the targeted ages of 12 and 24 months, made up two-thirds of those tested between 2017-2019 and over three quarters of those tested in 2020 and 2021.

Figure 4: Proportion of Mississippi Children Tested by Age, 2017-2021



2017-2021 Blood Lead Surveillance Snapshot

At this time, it is unclear if the increased proportion of one- and two-years-old in the population of children who were tested reflects actual changes in practices, i.e., fewer children being tested later due to missed earlier screenings, or if these differences are mainly related to the public health emergency. Analyses of future data will be needed to determine if these years indicate a changing trend, or if future results will return to patterns observed during pre-pandemic years.

Between 2017 and 2021, the percentage of children under 72 months of age who are provided a BLL test and had their results reported to the MSLPPHHP was low; however, low rates of testing and reporting are not exclusive to Mississippi. When comparing the percentages of children tested and reported in Mississippi to the percentages of children tested and reported across the country, Mississippi is not significantly different from the national average.

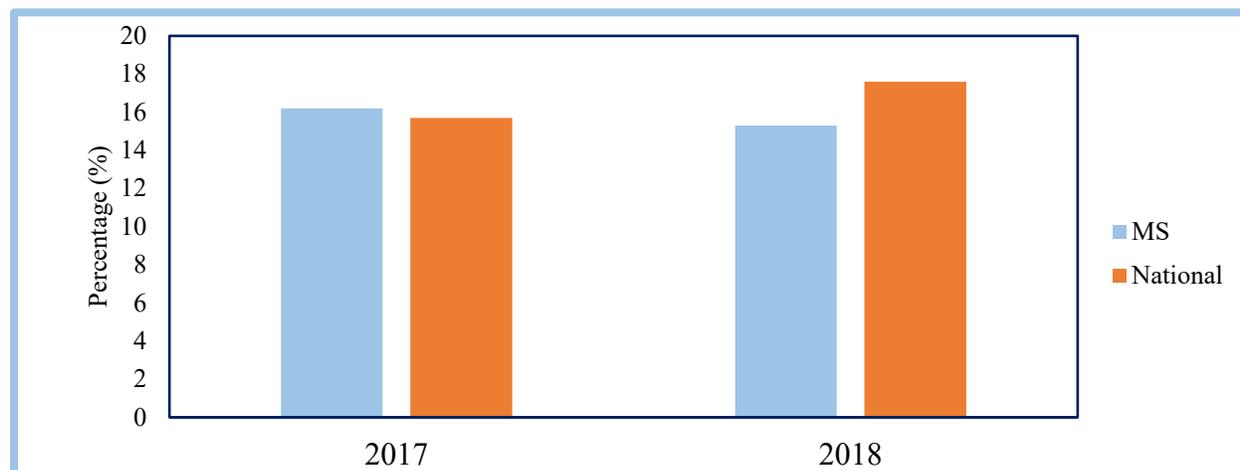
In 2017, the percentage tested for children less than 72 months of age in Mississippi was slightly higher than the national percentage (i.e., 16.2% compared to 15.7%); however, in 2018, the Mississippi testing rate for children less than 72 months of age was 2.3% lower than the national percentage (i.e., 15.3% compared to 17.6%).

Table 5: State and National Lead Testing Counts and Percentages, 2017-2018

	Mississippi		National ¹⁵	
	2017	2018	2017	2018
Number of Children Tested	41,811	39,433	2,860,043	3,320,389
Population < 6 Years of Age	258,074	258,074	18,169,611	18,865,195
Percentage of Children Tested	16.2%	15.3%	15.7%	17.6%

Source: CDC (Blood Lead Levels among U.S. Children < 72 Months of Age) and Mississippi HHLPPSS

Figure 5. State and National Lead Testing Rates, 2017-2018.



Source: CDC (Blood Lead Levels among U.S. Children < 72 Months of Age) and Mississippi HHLPPSS Rates may be different from other sources, based on when data was downloaded and submitted.

Given the importance of identifying children during their earliest years, more efforts are needed to increase the screening and reporting rates in Mississippi and across the nation.

¹⁵ National level data was only available for 2017 and 2018 at the time of this report.

2017-2021 Blood Lead Surveillance Snapshot

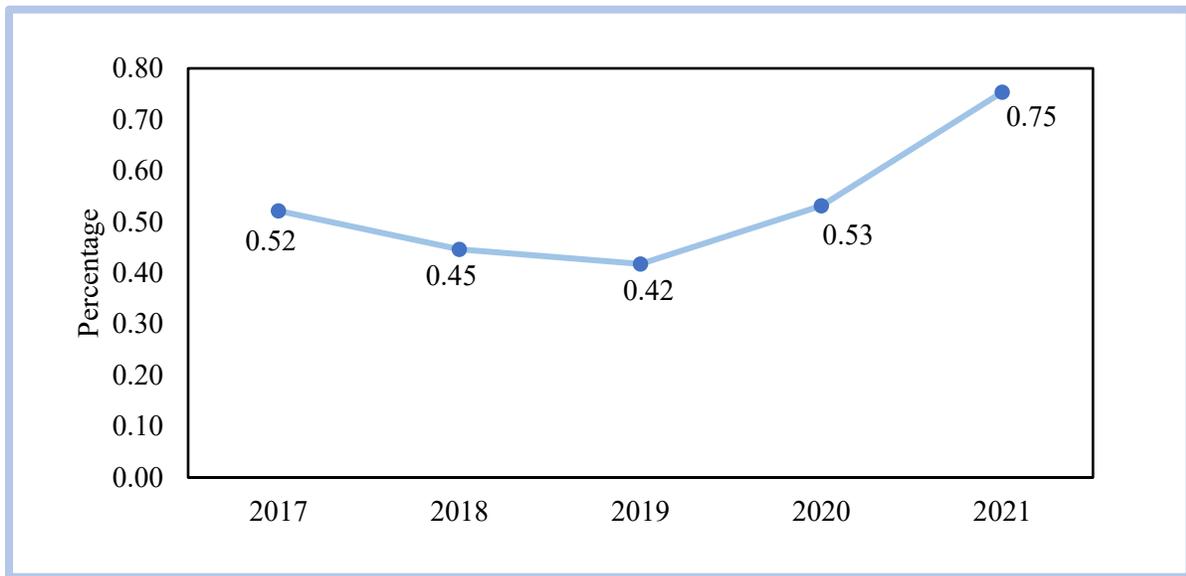
Between 2017 and 2021, 164,980 children under six (6) years of age received either a capillary or venous test for blood lead levels. Of these, 845 children, or 0.51 % of the number tested, were identified with an Elevated Blood Lead Level (EBLL), defined at that time as a child with ≥ 5 $\mu\text{g}/\text{dL}$ BLL. The table below breaks out the number of children tested for lead, number of children identified with an EBLL (i.e., ≥ 5 $\mu\text{g}/\text{dL}$), and percentage of children identified with an EBLL out of all the children tested for each year.

Table 6: Number and Percentage of Mississippi Children with an EBLL, 2017-2021

	2017	2018	2019	2020	2021	Overall
Number of Children Tested	41,811	39,433	35,918	26,721	21,097	164,980
Number of Children with EBLL	218	176	150	142	159	845
Percentage (%) of Children with EBLL	0.52%	0.45%	0.42%	0.53%	0.75%	0.51%

Between 2017 and 2021, the percentage of children in Mississippi with a confirmed EBLL of the children tested decreased from 0.52% (N=218 children) in 2017 to 0.42% (N=150 children) in 2019 before increasing to 0.75% (N=159 children) in 2021.

Figure 6: Percentage of Mississippi Children with an EBLL, 2017-2021



Although the percentage increase between 2019 and 2021 appears significant (i.e., an increase of 0.33%), the total number of children identified with an EBLL only increased by nine (9) cases. It should be noted the number of children identified in 2021 was an actual increase over the numbers identified in 2019 and 2020, compared to all other declining trends noted earlier (i.e., number of children tested); however, it is unclear if the children tested represented a population with greater risks than those who participated in BLL testing in previous years. Given the large decrease in numbers of children tested in 2020 and 2021, data for future years will need to be examined to determine if this indicates a changing trend in EBLL rates or if future rates will return to pre-pandemic levels.

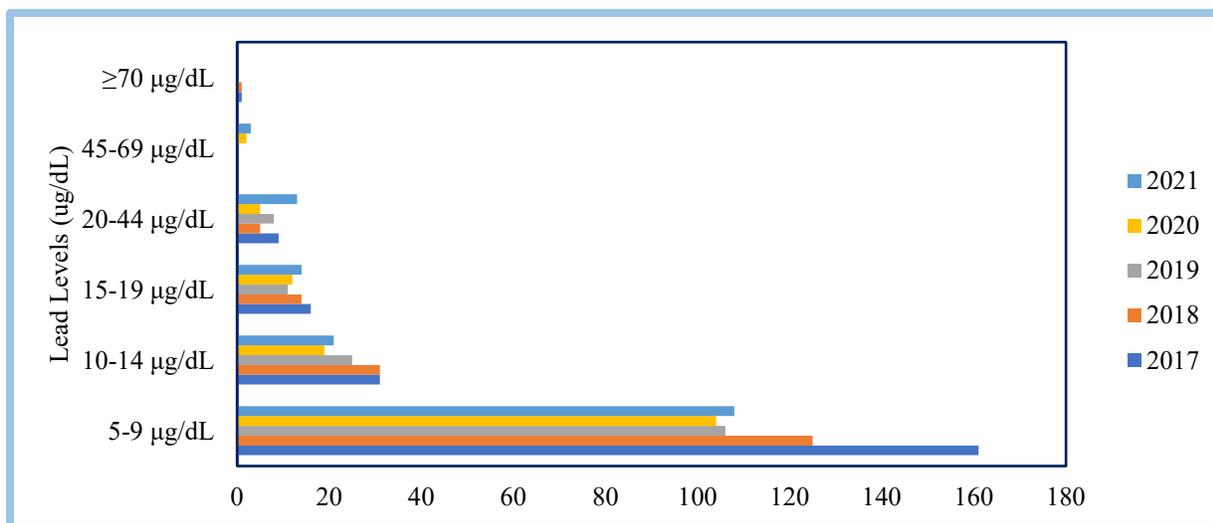
2017-2021 Blood Lead Surveillance Snapshot

Of the children identified with an EBLL between 2017 and 2021, the majority had an EBLL in the 5-9 µg/dL range. Far fewer children were identified in the 45-69 µg/dL or ≥ 70 µg/dL ranges, which indicate extremely high lead exposure. Of these children with an EBLL in the highest ranges, five (5) of the seven (7), or over 70%, were identified in 2020 and 2021.

Table 7: Number of Mississippi Children in the EBLL Ranges, 2017-2021.¹⁶

EBLL	5-9 µg/dL	10-14 µg/dL	15-19 µg/dL	20-44 µg/dL	45-69 µg/dL	≥ 70 µg/dL
2017	161	31	16	9	0	1
2018	125	31	14	5	0	1
2019	106	25	11	8	0	0
2020	104	19	12	5	2	0
2021	108	21	14	13	3	0
Total	604	127	67	40	5	2

Figure 7. Number of Mississippi Children in the EBLL Ranges, 2017-2021



When disaggregating the children tested and identified with an EBLL by sex, male children were more likely to be tested (N=79,634 children) and identified with an EBLL (N=423 children or 0.53%), than female children (N=75,657 children and N=371 children or 0.49%, respectively).

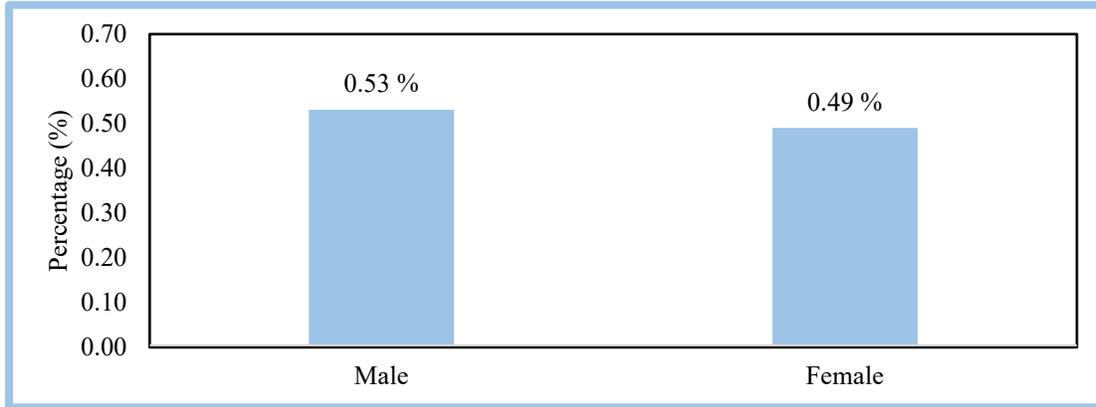
Table 8: Number of Mississippi Children Tested and Number and Percentage of Mississippi Children with an EBLL by Sex, 2017-2021.

	Male	Female
Number of Children Tested	79,634	75,657
Number of Children with an EBLL	423	371
Percentage (%) of Children with an EBLL	0.53%	0.49%

¹⁶ Some children were tested multiple times, resulting in being counted in multiple years, if they tested positive in different years, and in multiple EBLL ranges within a year, if their BLL increased or decreased within the year.

2017-2021 Blood Lead Surveillance Snapshot

Figure 8. Percentage of Mississippi Children with an EBLL by Sex, 2017-2021

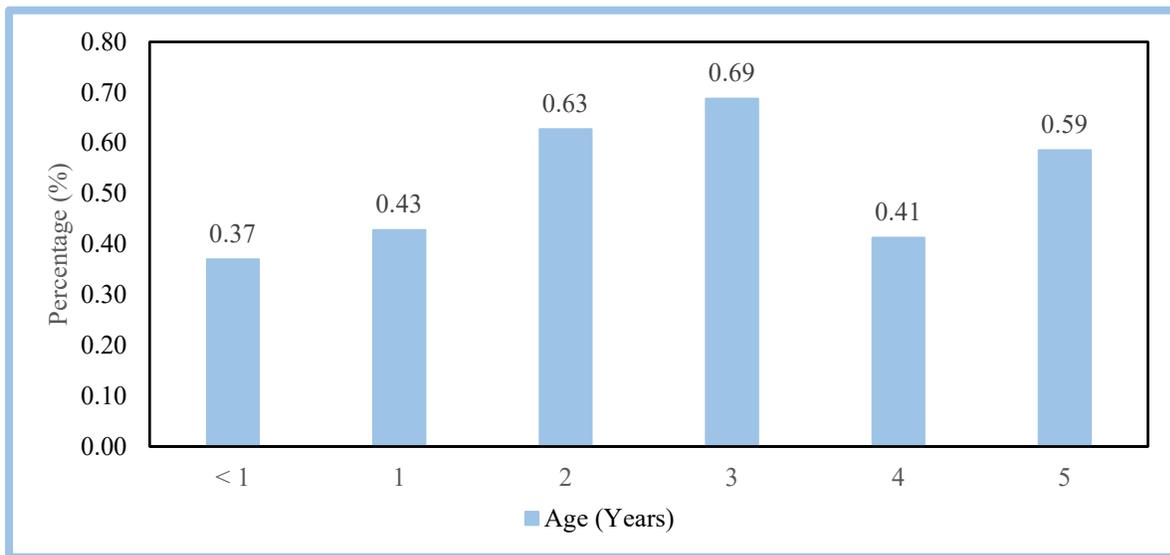


When disaggregating the children tested and identified with an EBLL by age in years, more one-year-old children were tested (N=65,883 children) and identified with an EBLL (N=282 children) than any other age group; however, three-year-old children had the highest percentage of tested children with an EBLL(0.69%) followed by children two 2 years of age (0.63%). This may reflect the continued testing and tracking of children identified with an EBLL when they were one- or two-years-old.

Table 9: Number of Mississippi Children Tested and Number and Percentage of Mississippi Children with an EBLL by Age in Years, 2017-2021

Age (Years)	< 1	1	2	3	4	5
Number of Children Tested	4,326	65,883	41,137	15,265	22,517	7,165
Number of Children with an EBLL	16	282	258	105	93	42
Percentage (%) of Children with an EBLL	0.37%	0.43%	0.63%	0.69%	0.41%	0.59%

Figure 9. Percentage of Mississippi Children with an EBLL by Age in Years, 2017-2021



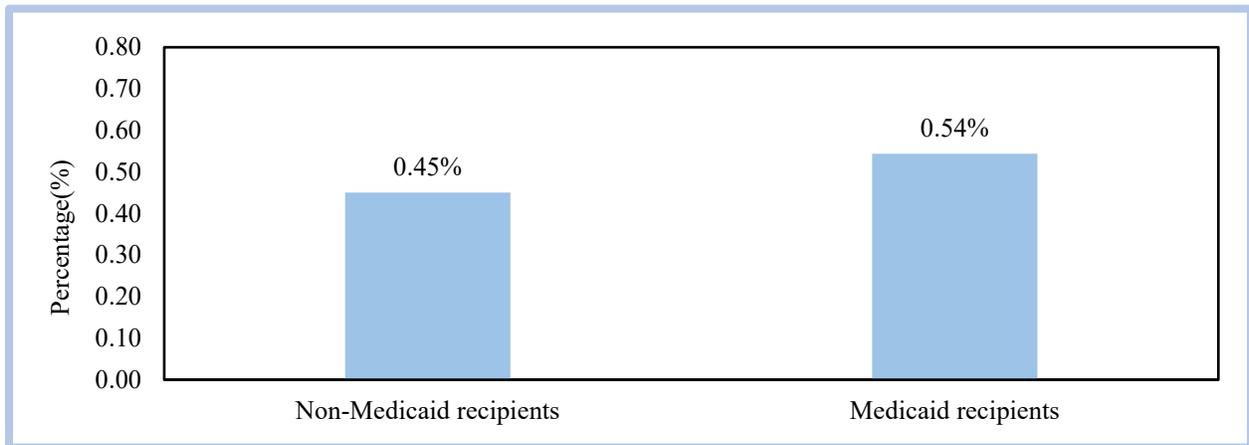
2017-2021 Blood Lead Surveillance Snapshot

When disaggregating the children tested and identified with an EBLL by Medicaid status, significantly more Medicaid recipients were tested (N=109,464 children) and identified with an EBLL (N=595 children) than non-Medicaid recipients. Further, Medicaid recipients were more likely to be identified with an EBLL (0.54%) than non-Medicaid recipients (0.45%). This may reflect the increased risk experienced by children who qualify for Medicaid, including living in older homes and environments with more risks.

Table 10: Number of Mississippi Children Tested and Number and Percentage of Mississippi Children with an EBLL by Medicaid Status, 2017-2021

	Non-Medicaid recipients	Medicaid recipients
Number of Children Tested	55,516	109,464
Number of Children with EBLL	250	595
Percentage (%) of Children with EBLL	0.45%	0.54%

Figure 10. Percentage of Mississippi Children with an EBLL by Medicaid Status, 2017-2021



STRATEGIES TO INCREASE EBLL IDENTIFICATION AND PREVENT LEAD EXPOSURE IN CHILDREN

Based on the findings of these data, the MSLPPHHP will prioritize working with families and healthcare providers to increase rates of BLL testing of children and reporting results.

1. To encourage families of children who are Medicaid recipients to receive a BLL test at the required 12- and 24-month well-child visits, the MSLPPHHP developed a *Well-Child Visit* flyer to mail to all families with a one- or two-year-old child who is a Medicaid recipient to remind them about the importance of keeping their Well-Child Visits to screen for lead poisoning as well as other conditions, such as anemia, high blood pressure, hearing and vision problems, and oral health problems.
2. The MSLPPHHP will partner with provider organizations, including the American Academy of Pediatrics (AAP), Rural Health Association (RHA), and others, to remind healthcare providers about the importance of lead screening and testing, as required by Medicaid and Bright Future guidelines.

2017-2021 Blood Lead Surveillance Snapshot

Let Us Know How You Use This Surveillance Report

- Why did you read this report?
- How did or how will you use the information provided in this report?
- What information in this report is most valuable to you?
- What additional information would you like to read about in future reports?
- How can the content of this report be improved?

Provide feedback by telephone:

601-576-7620 or 601-576-7447.