2018 Childhood Lead Surveillance Report

Lead & Healthy Homes Division

Indiana State
Department of Health

Table of Contents

EXECUTIVE SUMMARY

INTRODUCTION

The Lead and Healthy Homes Division of the Indiana State Department of Health (ISDH) is pleased to present the 2018 Childhood Lead Surveillance Report highlighting lead poisoning prevention activities across Indiana. Information contained in this report was compiled by the Lead and Healthy Homes Division in compliance with IC 16-41-39.4-5.

The ISDH and the Lead and Healthy Homes Division encourage all children between 6 months and 6 years of age to be screened for lead risk and tested if they meet any of the screening criteria. If parents or physicians are uncertain as to whether a child a child meets a screening criteria, the ISDH encourages testing of the child. The earlier that lead exposure can be identified, the more effective an intervention, both in the child's health and environment, can be.

This report provides data on the number of children currently being tested for lead, the number with an elevated blood lead level (EBLL), and the number of lead risk assessments performed for children with EBLLs. It also highlights a variety of actions taken by ISDH to increase testing rates, provide education on lead sources and impacts, support affected families, and improve Indiana's ability to manage lead exposure within the residential environment.

BACKGROUND

RECENT HISTORY OF THE DIVISION AND FUNDING

Since 2017, the ISDH lead programs have been housed in the Lead and Healthy Homes Division (LHHD). From 2012 to 2016, the programs were housed under ISDH's Environmental Public Health Division. The LHHD's primary goals are to track the prevalence of lead exposure in children throughout Indiana and to support local health departments in taking the necessary steps to minimize that exposure and the resulting health risks. This is done through proactive screening, treatment, case management, and remediation of lead hazards.

In 2018, the LHHD received funding from the Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA). CDC funding has been used to support maintenance of a case management system and surveillance system, while EPA funding has supported ongoing lead training, licensing, and inspection efforts. Indiana also received a supplemental, one-year, CDC award in 2018 that is being used to develop provider reports highlighting their testing rates and to provide direct support to local health departments as they seek to increase awareness and testing in their communities.

WHY LEAD IS A HEALTH CONCERN

Lead is a heavy metal that has been part of the world economy since the time of the Romans. In a 1980 report, Lead in the Human Environment, the National Academy of Sciences estimated that the United States was using 1.3 million tons of lead each year - about 40 percent of the world's supply[1]. It has been used throughout history for a variety of industrial and residential processes, including paint, plumbing, jewelry, and cosmetics. The most common lead exposure for children in Indiana occurs through lead-based paint. Lead was an additive to most paints prior to the ban on lead-based paint in 1978. As lead-based paint deteriorates with age, or when it is disturbed, such as during remodeling and repair projects, lead paint can generate paint fragments, chips, and dust. These particles can be ingested or inhaled by small children, with potentially significant health consequences. This is especially concerning in Indiana, where U.S. Census data show that more than 1.7 million homes, nearly 60% of all Indiana housing, were built before 1980[1].

Research has shown that EBLLs can negatively impact cognitive function and cause behavioral disorders and slowed physical development in young children. Children under the age of 7 years are more vulnerable to lead hazards due to the rapid growth of their bodies and brains. Young children, ages 2 years and under, are especially at risk due to the lack of a fully formed blood-brain barrier, which prevents lead from causing more substantial cognitive, neurological, and developmental delays. These children are also at a higher risk because they are more likely to put hands or other objects into their mouths. Lead exposure is particularly concerning because it affects each person differently. Some children may show no symptoms of delay even with EBLLs. In fact, signs of lead exposure could be mistaken for other conditions, such as ADHD, autism, or the flu.

The effects of exposure to lead can persist throughout a lifetime and include negative lifelong changes in intellect, behavior and health. Because these changes are lifelong, it is especially important for parents, healthcare providers, and public health officials to recognize the significance of providing surveillance,

[1] https://archive.epa.gov/epa/aboutepa/lead-poisoning-historical-perspective.html

early prevention, and education, as well as intervention and treatment. The ISDH LHHD is committed to providing assistance and support to those local health departments and community partners who are providing direct services, conducting surveillance, identifying at-risk children, and monitoring the treatment of those who have confirmed EBLLs.

INDIANA STATUTE AND RECOMMENDATIONS

In Indiana, all blood samples analyzed for the presence of lead are required to be reported to the ISDH within one week of analysis. The ISDH provides lead screening requirements and medical management recommendations to providers, encouraging screening of all children and testing of those who match any of the identified risk criteria. All children enrolled in Medicaid are required to receive lead testing at 12 and 24 months of age or as soon as possible between 24 and 72 months of age if they have not previously been tested.

With no safe level of lead in blood, the ISDH encourages all parents to get their children tested early and often if they are concerned their child may have been exposed to lead. Many local health departments across Indiana provide support and case management services to children at levels as low as 5 µg/dL. Resources related to prevention, lead policy, abatement, and the health impacts of lead can be found on the LHHD page of the ISDH website at https://www.in.gov/isdh/26550.htm.

410 IAC 29 mandates reporting, monitoring and prevention of lead poisoning in Indiana, including the reference value levels observed to initiate public health action by the state. In this statute, a blood lead test is considered confirmed with either a single venous blood test or two capillary blood tests with a blood lead result $\geq$10 µg/dL, which was the recognized recommended threshold for 'blood lead level of concern' at the time the rule was written.

Although people of all ages can be affected by exposure to lead, children under the age of seven years are especially at risk because they are still growing and their brains are still developing. Children at higher risk for lead exposure tend to live in households in which residents are:

- Lower-income,
- Racial or ethnic minority groups,
- Recent immigrants (especially those from Central America, South America, North Africa, and the Middle East where lead can be prevalent in spices, cosmetics, jewelry, ceramics, and medicine)
- Residing in properties built before 1978
- Residing in older, poorly maintained properties
- Have parents or household members who work in industries that deal with lead (i.e. battery manufacturing and recycling, auto repair, or construction)

An at-risk child is defined by 410 IAC 29-1-2 as a child who:

- lives in or regularly visits a house or other structure built before 1978;
- has a sibling or playmate who has been lead poisoned;
- has frequent contact with an adult who:
    - works in an industry that uses lead;
    - has a hobby that uses lead;
- is an immigrant or refugee or has recently lived abroad;

- is a member of a minority group;
- is a Medicaid recipient;
- uses medicines or cosmetics containing lead; or
- lives in a geographic area that increases the child's probability of exposure to lead

In Indiana, blood lead testing is most often conducted by family physicians and pediatricians, either in-office or through a referral to a testing laboratory. Testing is also routinely conducted by local health departments through their clinical services offered in-office and remotely. Less frequently, testing is also performed by nurses and medical staff through organizations like the Indiana Women, Infants and Children (WIC) program and Head Start through private funding.

To aid in effective case coordination and surveillance, Indiana statute also requires that accurate and complete data accompany any blood lead sample submitted for analysis. That data must include:

(1) With respect to the individual whose blood is examined:
   A. Full name
   B. Date of birth
   C. Gender
   D. Full address, including street address, city, and ZIP code
   E. County of residence
   F. Race and ethnicity
   G. Parent or guardian's name and phone number, where applicable
   H. Any other information that is required to be included to qualify to receive federal funding

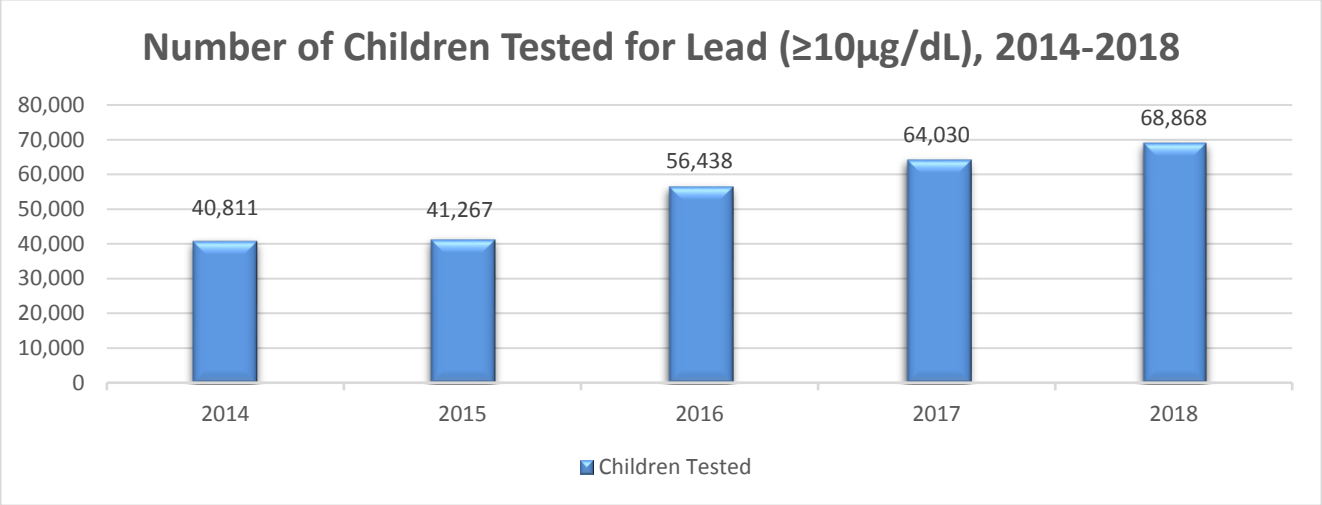
(2) With respect to the examination:
   A. Date
   B. Type of blood test performed (venous or capillary)
   C. Normal limits for the test (interpreted as elevated or non-elevated)
   D. Test results
   E. Interpretation of test results by the person who examined the specimen for the presence of lead

For additional information on the full lead result reporting code, please visit the Indiana Administrative Code. Please consult the following link for more information about reporting blood lead results: https://secure.in.gov/isdh/files/FINAL(2.0)CD_Reportable_Diseases_List-1-7-2016.pdf.

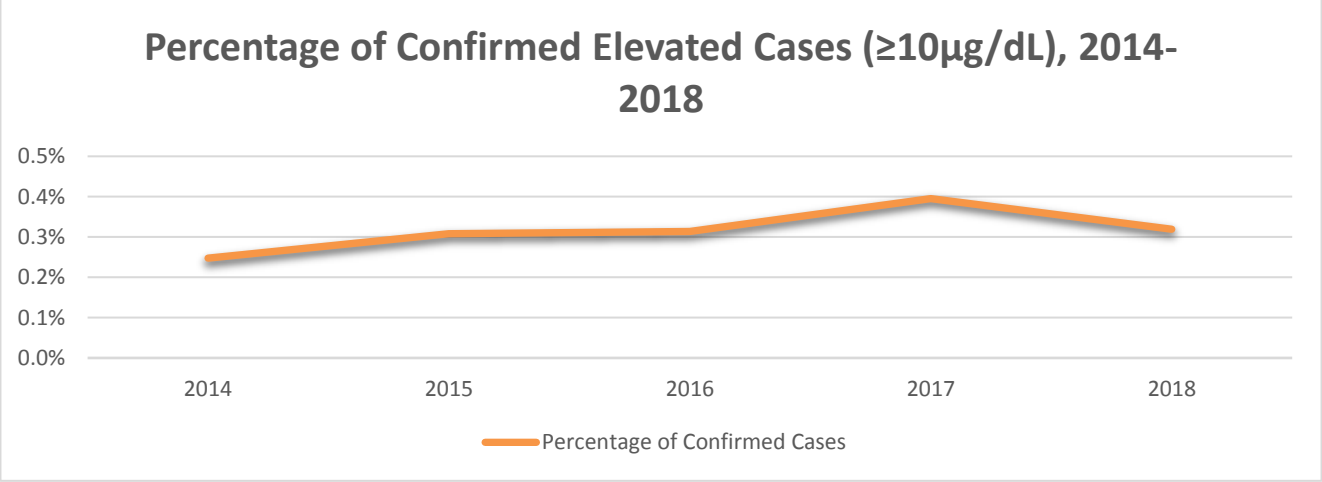
2018 HIGHLIGHTS

SCREENING

In 2018, the ISDH received 73,902 lead test results for children under age 7 years from medical providers, laboratories and other public health partners. Of these results, 1,007of them, or 1.4%, were considered elevated. These results included tests from 68,868 unique children under age 7 years who were tested in Indiana.



Of those children, 619 (0.90%) had at least one elevated result, and 220 (0.32%) had a confirmed elevated result[2]. On average, children who were confirmed to have an EBLL were confirmed in 21.2 days.



[2] The total number of tests received includes both venous and capillary tests, and accounts for initial tests and follow-up tests done on children whose blood lead levels were elevated. According to Indiana statute, a child becomes a confirmed case when he or she receives at least one venous blood test or two capillary blood tests within a three-month period, with a blood lead result at or above 10 µg/dL. In the city of East Chicago, a blood lead level is considered elevated at or above 5 µg/dL.

The ISDH also collects demographic information on gender, race, and ethnicity with blood lead test results. Samples that contain "unknown" or leave the field blank are accepted by ISDH. Gender is the most complete, with race and ethnicity having 26.9% and 39.5% reported as unknown or blank.

Among the 68,868 unique children who received blood lead tests in 2018, 51.4% were male, 48.4% were female, and 0.1% did not have gender reported. The percentage of confirmed EBLLs was not significantly different between males and females (Table 1). In terms of a racial breakdown of children tested, 34.9% of the children did not have a race identified. Among those with a reported race, 37.0% of children were white, 21.8% of children tested were black. (Table 2). Ethnically, 10.1% of children tested identified as Hispanic and 50.4% identified as non-Hispanic, and 39.5% had an unknown ethnicity. The percentage of confirmed EBLL was not significantly different between Hispanic and non-Hispanic children (Table 3). However, the large number of children with unknown race and ethnicity adds uncertainty to the race and ethnicity statistics.

Summary of Reported Demographics for Children Aged <7 Years Blood Lead Tested and EBLL Cases Confirmed in 2018[3]

Gender	Tested (%)	EBLL Cases	Percent EBLL
Male	35,416 (51.4%)	118	0.33%
Female	33,358 (48.4%)	100	0.30%
Unknown	94 (0.1%)	2	2.13%

Table 1: Gender

Race	Tested (%)	EBLL Cases	Percent EBLL
American Indian	3,066 (4.5%)	9	0.29%
Asian/Pacific	365 (0.55)	*	0.27%
Black	15,001 (21.8%)	52	0.35%
White	25,480 (37.0%)	78	0.31%
Multiracial	930 (1.4%)	*	0.22%
Other	5,495 (8.0%)	21	0.38%
Alaska Native	(0.0%)	-	0.00%
Unknown	18,529 (26.9%)	56	0.31%

Table 2: Race

Ethnicity	Tested (%)	EBLL Cases	Percent EBLL
Hispanic	6,943 (10.1%)	25	0.36%
Non-Hispanic	34,740 (50.4%)	123	0.35%
Unknown	27,185 (39.5%)	71	0.26%

Table 3: Ethnicity

Compared to 2017, Indiana saw an increase in the overall number of tests conducted and children screened, but a drop in the number of children identified as having an EBLL. While this follows national trends for decreasing mean blood lead levels, early childhood exposure to lead remains a significant,

[3] Cells with an asterisk (*) indicate the value for that cell has been suppressed due to the total number of representative individuals being less than five.

solvable problem for Indiana residents. Lead testing rates do not reflect that all, or even a majority, of Indiana's children are screened and tested at recommended intervals. Achieving improvements in testing rates requires working with parents to stress the importance of requesting testing, partnering with physicians to emphasize why testing is important, and working with housing partners to identify ways to minimize or eliminate lead hazards.

One population which reflects the challenge associated with getting lead testing to be a priority is children insured through Medicaid. All children insured by Medicaid in Indiana are required to receive a blood lead test at 12 and 24 months of age, or as soon as possible before age 6 years if not tested at 12 and 24 months. In 2018, 89,164 children receiving Medicaid benefits were between the ages of 1 and 2. However, only 18,405, or 21% of children who were 1 or 2 during 2018, had a blood lead test billed to Medicaid. This 79% gap of indicates that there are still significant challenges in educating parents and physicians about the importance of conducting and reporting of blood lead testing. Looking into 2019 and 2020, the ISDH will be focusing on this population with pilot projects and targeted interventions aimed at steadily increasing the percentage of children tested. Specific future efforts to address this challenge will include issuing comparison reports to providers and insurers highlighting missed opportunities for testing, targeted testing among WIC recipients, a detailed review of the process and effectiveness of current surveillance systems, and increasing community engagement among at-risk populations.

EDUCATION

In support of the goal to eliminate childhood lead poisoning as a public health problem, effective education and outreach efforts are essential. In 2018, health education staff focused efforts to expand and build on the foundation of existing strategies to inform, educate, and reach healthcare professionals, the public, and community partners on the risk and hazards of exposure to lead, principally through a range of primary prevention initiatives.

Throughout 2018, the ISDH continued efforts to maintain trained individuals to provide case management services at the local health departments as mandated in Indiana Administrative Code (410 IAC 29-1-5). The statute authorizes the ISDH to provide training to the designated local health department staff who provide case management services to the families of children with an EBLL. Ten comprehensive onsite trainings covering information on a variety of points, including lead hazard sources, test reference values, medical management recommendations, and home visit and environmental investigation requirements were provided to local health department staff representing 10 counties, with the majority being public health nurses. In an effort to expand the accessibility of this training, an online platform of the case management education training was developed. Extensive work was done to develop accompanying documents, an instructional video, and assessment and evaluation tools. The training modules were placed on Indiana TRAIN, a free online comprehensive catalog of public health training opportunities. The training serves as an alternate option for training local health department staff when the ISDH LHHD health educator cannot provide training to a new case manager within six months of hire. The training will also serve as a review tool for all case managers to use as needed. A pilot and complete launch of the platform is anticipated for early 2019.

Primary prevention to reduce or eliminate the myriad sources of lead in the environment of children before exposure occurs is the most reliable and cost-effective measure to protect children from lead toxicity.[4] Educating the public about the many lead hazards present in the environment and home; the

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

significant physical, behavioral, and intellectual impacts exposure to those hazards has on the health of young children; and strategies to correct the hazards that have been found are critical components of the materials and presentations provided by the ISDH LHHD program to a variety of partners and audiences. One way that this education was provided was through a partnership with the ISDH Maternal and Child Health Division to distribute lead and pregnancy education information through "LIV," the free pregnancy mobile application for Indiana females of all ages who want the best information and resources to help them take charge of their reproductive health. "LIV" offers extensive information for women who are planning to become pregnant, trying to avoid or time pregnancy, are already pregnant, or are parenting an infant.

The ISDH also expanded its digital reach to partners and public health providers through the quarterly release of four electronic newsletters. The newsletters were distributed to the health officer, office manager and case manager for each of the 93 local health department across the state, as well as to partners at managed care organizations and selected WIC offices throughout the state. Each issue included updates and important, relevant and current information on a variety of lead and healthy homes topics. The same partners who received the newsletters also received announcement emails throughout the year containing important topics such as registration information for the 2018 Midwest Lead & Healthy Homes Conference, hosted by ISDH in November, information about National Lead Poisoning Prevention Week, and grant opportunities. Facebook and Twitter messages concerning lead and toy safety, National Lead Poisoning Prevention Week, and National Healthy Homes Month were also distributed through the ISDH accounts to raise awareness of lead hazards and the safety precautions that should be taken in the home. Efforts also continued throughout 2018 to maintain and improve the information presented on the ISDH Lead and Healthy Homes Division webpage.

Several opportunities in 2018 broadened the scope of audiences reached with lead toxicity prevention education and awareness messages. Some of those opportunities included:

- Exhibit space and opportunities for one-on-one conversations to those in attendance at four conferences, including the Indiana Environmental Health Association Fall Conference, Alliance of Indiana Rural Water Fall Conference, WIC Education and Training Conference, and the Indiana Association of School Nurses Conference
- A presentation to a group of high school Family and Consumer Science Early Childhood classroom educators who provide instruction to students pursuing a future in a career in early childhood education. Those in attendance were educated about the hazards of lead in the environment and preventative measures. They were also provided with strategies for ways to integrate this information into their classroom instruction.
- Exploration of a future statewide, student lead awareness campaign regarding lead poisoning safety was discussed with the 10 state officers and their advisors of the student professional organization, Family, Career and Community Leaders of America (FCCLA). These elected student leaders represent 85 chapters and 2,675 high school age students who are a part of this leadership development organization. Additional discussions for this awareness campaign are planned for 2019.

DATA MANAGEMENT IMPROVEMENTS

In 2018, ISDH achieved several improvements in data management. Efforts were focused on increasing transparency and efficacy of day-to-day operations. These efforts included upgrades to records storage, case tracking and surveillance, and record deduplication.

In January of 2018, the ISDH started the digitization of lead licensing and case management records. Historically, paper copies of all blood lead results received, licensing files, and case management correspondence would be kept onsite until either the case was closed or the records were due to be archived, at which time they were packaged and sent to Archives Administration. This presented a challenge in housing and searching those records. Beginning in 2018, staff began scanning all paper records and filing them electronically, allowing case managers to quickly reference case files and add new case information to an existing file. The goal of this project is to have all pre-2019 records digitized by 2020.

The ISDH also worked in 2018 to improve the way case surveillance staff are able to track active cases, ensuring that children with EBLL were receiving needed support. A new tracking tool was implemented that allows surveillance staff to quickly filter active cases by county, blood lead level, child name, and a variety of other factors. This tool allows staff to review at-a-glance whether or not a child is overdue for a retest, home visit, or risk assessment. It also allows ISDH to help new local health department staff understand a county's case load, a child's blood lead history, and actions taken relative to each case. This tool will continue to be refined, giving ISDH staff and leadership the ability to quickly reference actions and progress relative to any child with an EBLL.

In a departure from prior efforts, and after exhaustive testing of several CDC lead case management platforms, the ISDH made the decision to stop future development of the Healthy Homes and Lead Poisoning Surveillance System (HHLPSS) and instead begin development of a lead module for the National Electronics Disease Surveillance System (NEDSS) Base System (NBS). This platform shift should ultimately give Indiana a more customizable tool which will include lead reporting in the same platform used by Indiana's local health departments for managing communicable diseases. The ISDH will build the new systems in 2019 and expects a rollout of the new system in late 2019 or early 2020.

Another area in which ISDH worked to improve data quality in 2018 was the creation of an automated deduplication protocol. This tool was created to save staff from having to manually filter blood lead results for the same child's test reported by multiple facilities. This deduplication protocol allows staff to quickly cross reference results based on the name, date of birth, address, result, and collection date to determine which results are the same. This process has allowed ISDH to more quickly pull reports on the number of unique children screened by county and is being used to help provide local health departments with information on non-elevated blood lead results received by ISDH on a more regular basis.

PARTNERSHIPS

Understanding that ISDH alone cannot accomplish the goals of improving rates of blood lead testing, managing those with elevated blood lead levels, and addressing lead hazards in all forms, the LHHD partnered with groups from across the state that could help. Below are some examples of the partners in 2018 who have helped support this work and are working to make change possible:

Local health departments - With regular visits to local health departments and presentations to groups such local health officers and public health nurses, the LHHD has continued to adjust its focus to better match the needs of partners on the ground. Specific requests for 2018 included increasing the ability to see provider-level lead testing frequency and the ability to see more information on all test results received, including low-level and zero-level test results. These requests were fulfilled with the creation of tools like provider-level comparison reports (showing Medicaid lead billing versus reported testing) and quarterly reports to each health department showing each <5 µg/dL result received.

Medicaid Managed Care Organizations - Success in getting clinics, physicians, and families to recognize the importance of required lead testing for children on Medicaid starts with their Managed Care Organization (MCO). With 260,905[5] children enrolled with one of the four MCOs at the end of December 2018, the ISDH has been working with these groups to boost overall lead testing rates among their members. In 2018, the ISDH met with each of the MCOs on a bi-monthly basis to review MCO challenges, encourage promotion of the Lead Protection Program, develop tools for measuring testing rates, and create brochures and program marketing material which MCOs could deliver to families during case management visits.

Indiana Housing and Community Development Authority (IHCDA) - As one of Indiana's largest providers of safe, affordable, quality housing, IHCDA shares a common interest with the ISDH in wanting to ensure that Indiana's most vulnerable populations live in housing free from lead hazards. In 2018, both organizations improved information sharing capabilities regarding Section 8 properties potentially affected by lead hazards, lead license reviews for contractors conducting a lead risk assessment, and leveraging multiple sources of lead remediation funding in target communities.

Indiana American Water (IAW) - In July of 2018, IAW became the first water utility in the state to obtain authority to replace lead service lines back to a home even though the line from the main to the home is not owned by the utility. This achievement built upon the passage of legislation passed in HEA 1519 in 2017. The replacement of as many as 50,000 lead service lines will take place over the next 10-25 years depending on funding. The ISDH reached out to meet with IAW once the Indiana Utility Regulatory Commission approved the plan in an effort to help IAW prioritize where to target replacement over the life of the plan and to marry lead line replacement with other lead prevention and remediation efforts throughout the state.

East Chicago - As EPA and the Indiana Department of Environmental Management (IDEM) efforts related to site clean-up continued in East Chicago in 2018, the ISDH continued to provide support to the local response effort led by the East Chicago Health Department (ECHD). The ISDH provided a one-time, one-year award of $70,000 to the ECHD in July to help support a full-time nurse for ongoing lead case management and lead testing services. The ISDH also partnered with ECHD and HealthLinc to conduct a community testing event in Zone 2 of the EPA Superfund site in October.

Indiana Department of Education (IDOE) – The IDOE is a willing partner in assisting with the distribution of information and resources concerning lead toxicity to school nurses across the state. A close working relationship between the LHHD Health Educator and the IDOE School Nurse Program Director helped to facilitate the posting of a resource document on the Learning Connection, an IDOE-developed, online communication platform frequently used by school nurses across the state. The ISDH developed a

[5] Medicaid Monthly Enrollment Reports https://www.in.gov/fssa/ompp/4881.htm

resource document that contains local and national science based resources appropriate to be used for school and parent education on lead hazards and their potential impacts.

TARGET POPULATION IDENTIFICATION AND INTERVENTION

One of the key components to delivering effective lead education and intervention is knowing which populations are at the highest risk and providing those families resources to help mitigate it. To this end, in 2018, the ISDH continued to build on interventions, such as the Lead Protection Program launched in prior years, and sought to deliver new tools, like a Lead Exposure Resource Guide, to those who could best use them.

With the help of one-time supplemental funding from CDC in 2018, LHHD leadership hired a project manager to help launch an effort to compare ISDH blood lead testing and immunization data and Medicaid lead claim data. The goal of this project is to identify gaps in both service provision to children receiving Medicaid benefits (i.e., immunizations were delivered, but lead levels were not tested) and in reporting (i.e. a lead test was billed to Medicaid but no test was reported to the ISDH). The ISDH project manager was charged with aggregating data sets from various divisions and Medicaid and producing comparison reports which would be shared directly with physicians, practice groups, local health departments and Medicaid MCOs. This information allows each of these groups to review internal operations and determine if there are opportunities for improvement. This project is funded through 2019.

The ISDH also continued efforts in 2018 to roll-out the CHIP-funded lead abatement program under the moniker of Indiana's Lead Protection Program. The Children's Health Insurance Program (CHIP) is a federally funded program administered by Indiana's Family and Social Services Administration's Office of Medicaid Policy and Planning and is targeted at providing medical care to children up to age 19. The program rolled out in 2018, with efforts to find and abate lead issues in homes of families with children receiving Medicaid benefits. The program gained momentum in key communities of South Bend, East Chicago and Michigan City as community members and local lead affinity groups learned more about what the program is able to do and the benefits to residents. By the end of the year, the program had received 95 applications from targeted communities across northern Indiana. The program will advance into 2019 with a focus on developing a larger lead contractor base and increasing program interest in communities like Hammond and Gary.

Funding for lead remediation at a local level grew significantly in Indiana in 2018, with the U.S. Department of Housing and Urban Development (HUD) providing funds in December to the cities of Fort Wayne, South Bend, and Michigan City. These awards, which cumulatively total $7,779,945,[6] will be instrumental in allowing each of these communities to identify and remediate homes with lead and other health hazards. ISDH staff met with city officials in Michigan City and South Bend in advance of this funding and are committed to providing each of the awarded cities the information, connections, and resources needed to be successful in alleviating lead risks from their communities. In 2019, HUD is expected to award additional funds to communities throughout Indiana for lead-based paint protection.

Working on the assumption that WIC recipients are more likely to be members of at-risk populations, ISDH's LHHD and WIC Divisions partnered in 2018 to specifically target a message encouraging lead screening to families receiving WIC benefits. The message (right) was successfully delivered to more than

[6] https://www.hud.gov/press/press_releases_media_advisories/HUD_No_18_149

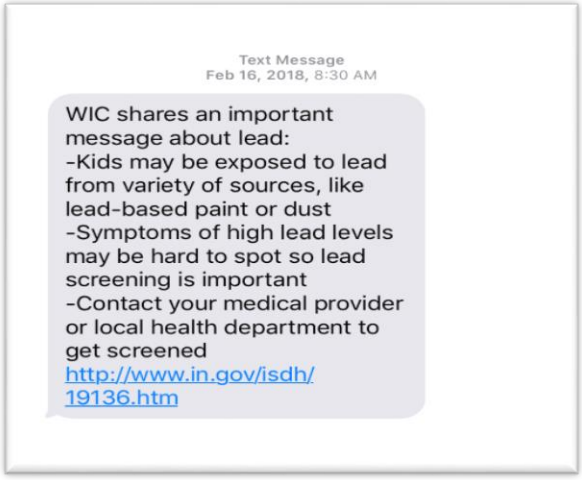
105,000 households. Research released in June of 2018[7] reinforces the strategy of targeting outreach toward WIC families, noting that children ages 1-5 years from WIC recipient families (whether receiving Medicaid or not) are likely to have higher blood lead levels than children in families not enrolled in WIC or Medicaid.

Lastly, in response to lead exposure events in East Chicago and Muncie, during the spring of 2018, ISDH developed a Lead Exposure Resource Guide for local health departments. The guide provides local health departments with information on how to interact with authorities to assess the situation, practical guides on blood lead clinic setup and supplies, and recommendations on information and messaging to provide. While no community wants to have to use this guide, with the prevalence of lead in homes and the environment, ISDH wants to equip local health departments to be the front-line response to situations in their communities.

ENVIRONMENTAL INVESTIGATIONS

Per 410 IAC 29-1-22, a risk assessment is defined as an assessment of lead hazards from any structural source by a licensed risk assessor. These assessments include recommendations to mitigate identified lead hazards, a written report to the family and the owner of the residence if not owned by the family, education on the lead hazards in the home, and suggest ways to protect children from further poisoning. A lead risk assessment is conducted when a child under 7 years of age has a confirmed EBLL of 10 µg/dL.

In 2018, 864 lead risk assessments were conducted in Indiana by ISDH staff, city and county health departments, and private risk assessors. During the year, 194 risk assessments were completed due to the presence of a child under 7 years of age with an EBLL who resided or spent a significant amount of time at the location. Lead hazards were identified in 157 of the houses inspected. Table 4 represents the number of houses with each type of hazard identified: cosmetics, dust, exterior lead-based paint, interior lead-based paint, food, soil, or unknown.



Types of Lead Hazards	Number of Houses with Lead Hazards Identified
Cosmetics	1
Dust	125
Exterior Paint	124
Food	1
Interior Paint	122
Soil	32
Unknown	2

Table 4: Lead Hazards Identified versus Number of Houses

[7] Aoki, Y. & Brody, D. J. (2018). WIC Participation and Blood Lead Levels among Children 1-5 Years: 2007-2014 *Environmental Health Perspectives* https://ehp.niehs.nih.gov/doi/10.1289/EHP2384

Indiana issues licenses, in accordance with 410 IAC 32, for the following disciplines: inspector, risk assessor, project designer, supervisor, worker, contractor, and clearance examiner. Licenses can be obtained through completion of training courses offered by Indiana-approved training providers, or through reciprocity. Those who seek licensing through reciprocity must have a current U.S. EPA state or tribe authorized lead-based paint program license from another state. In 2018, the LHHD worked to improve the lead licensing process for lead professionals by developing a new tracking system to ensure licenses are approved in a timely manner and to track the number of licenses issued. This new tracking system allowed the LHHD to review and approve license applications more quickly than in prior years and has allowed program staff to follow up with training attendees to ensure questions and concerns are addressed that might have hindered pursuing full licensure.

Lead abatement contractors are granted licenses in Indiana through required training, verification of past compliance due to lead abatement activities, and liability insurance. In 2018, Indiana had 42 active lead abatement contractors who were authorized to perform lead abatement work. Nineteen lead abatement projects were conducted throughout the state, and four of these sites were completed with abatement funding from the FSSA CHIP Program. The other 15 projects were privately funded by homeowners or landlords.

The ISDH has also improved the tracking of lead abatement activities being conducted throughout the state by assigning a trained lead risk assessor from ISDH to each abatement project. This dedicated, state-level point of contact has resulted in increased numbers of inspections both during and after work and has given contractors a single point of contact for any questions or concerns they may have about best practices or state rules.

In 2018, the ISDH saw an increase in the number of abatement jobs throughout the state and continued improvement in relationships and recruitment of lead contractors.

2019 GOALS

In looking towards 2019, the ISDH seeks to improve its ability to identify and address lead hazards affecting Hoosiers in a variety of ways. First and foremost, we will continue to serve as the central point for information on lead case management, helping families know what to do when their child has been diagnosed with an elevated blood lead level, or they believe they are at risk. Second, we will work with state and local partners to better identify areas of lead risk using statewide data on housing age, poverty, historical blood lead levels, and other relevant data, as available. Third, we will work to ensure that all providers and labs conducting testing have access to an easy-to-use reporting tool so that required reporting is not seen as a burden. Finally, we will work to improve the quality and amount of data available to partners who can help drive increased testing rates. By giving local nurses, healthcare providers, and Medicaid insurers information on which children aren't being tested, and by providing local health departments with information on every test for every child in their jurisdiction, lead challenges and successes will become a matter of local importance.

2018 COUNTY DATA

Data listed in the table below is broken down by county, with the following limitations:

- County results only include children whose test results identified a county.
- Children with and without a county listing are included in the State of Indiana totals.
- A test result is elevated in Indiana at or above 10 µg/dL, except in East Chicago in Lake County, where a test result is elevated at or above 5 µg/dL.
- A child becomes a confirmed case when he or she receives either a single venous blood test or two consecutive capillary blood tests with an EBLL.
- The number of risk assessments and identified hazards is included by county. However, risk assessments can be conducted for children who do not have an EBLL, and the number of hazards identified may be larger than the number of risk assessments done due to homes having multiple lead hazards.
- Clearance exams are only conducted if lead hazards are identified during the risk assessment and if efforts have been made by the property owner to alleviate the issues. If no hazards are reported, Indiana law does not require a clearance exam.
- If fewer than five results for any given county data point were identified, the values were suppressed to maintain confidentiality. Suppressed values are identified with an asterisk (*).

County	Number of Tests	Number of Children Tested	Number of Elevated Tests	Number of Children with at least 1 Elevated Test	Number of Confirmed Children	Children who had a confirmed elevated result followed by at least 1 result below 10 in 2018	Total Risk Assessments Completed in 2018	Risk Assessments for Children Confirmed in 2018
Adams	171	163	-	-	-	-	11	-
Allen	3,344	3,158	82	56	14	*	38	21
Bartholomew	592	564	7	4	-	-	18	*
Benton	88	83	*	*	*	*	*	*
Blackford	152	136	*	*	*	*	*	*
Boone	465	435	*	*	-	-	-	-
Brown	105	104	-	-	-	-	-	-
Carroll	322	309	*	*	-	-	*	-
Cass	655	609	37	14	6	-	8	7
Clark	1,555	1,495	9	7	*	*	6	*
Clay	257	253	6	5	*	-	*	*
Clinton	615	501	17	10	*	*	*	*
Crawford	83	82	-	-	-	-	-	-
Daviess	122	115	*	*	-	-	5	-
Dearborn	304	294	*	*	*	-	15	-
Decatur	290	281	*	*	*	*	*	*

DeKalb	294	285	*	*	*	*	*	*
Delaware	986	892	29	16	5	*	7	*
Dubois	65	61	*	*	*	-	*	-
Elkhart	5,106	4,505	69	49	9	*	10	*
Fayette	269	250	9	*	*	*	9	*
Floyd	1,115	962	11	*	*	*	*	*
Fountain	97	90	*	*	*	-	*	*
Franklin	291	280	*	*	-	-	*	-
Fulton	165	159	*	*	-	-	*	-
Gibson	303	285	*	*	*	-	5	*
Grant	1,153	1,064	10	9	*	-	9	*
Greene	436	426	-	-	*	-	-	-
Hamilton	2,477	2,383	*	*	*	*	*	*
Hancock	452	422	*	*	-	-	*	-
Harrison	542	635	*	*	*	*	9	-
Hendricks	598	559	*	*	-	-	*	-
Henry	289	276	5	*	*	*	*	-
Howard	1,142	1,107	15	9	*	*	7	*
Huntington	171	152	8	*	*	*	*	*
Jackson	559	523	9	7	*	-	27	*
Jasper	205	194	*	*	*	-	-	-
Jay	191	182	*	*	-	-	*	-
Jefferson	358	338	*	*	-	-	9	-
Jennings	189	181	*	*	*	-	8	*
Johnson	1,055	989	15	11	*	*	*	*
Knox	266	250	6	*	*	*	*	5
Kosciusko	613	599	*	*	*	*	*	-
LaGrange	73	71	*	*	-	-	*	-
Lake*	4,783	4,383	83	46	21	8	105	12
LaPorte	1,110	1,056	12	7	*	*	17	*
Lawrence	742	707	8	5	*	*	32	*
Madison	1,980	1,861	28	19	8	*	18	5
Marion	13,302	12,243	136	93	35	19	230	25
Marshall	451	425	*	*	-	-	*	-
Martin	103	95	-	-	-	-	-	-
Miami	316	307	*	*	-	-	*	*
Monroe	2,495	2,457	6	*	*	-	*	*
Montgomery	452	406	9	6	*	*	22	*
Morgan	751	721	5	*	*	*	*	*
Newton	91	85	-	-	-	-	*	-
Noble	193	180	6	*	*	-	-	*

Ohio	34	32	-	-	-	-	-	-
Orange	173	162	8	*	*	-	5	*
Owen	343	328	9	*	*	*	*	*
Parke	112	111	-	-	-	-	-	-
Perry	109	108	-	-	-	-	-	-
Pike	77	76	-	-	-	-	6	-
Porter	802	783	6	6	-	-	*	*
Posey	205	202	-	-	-	-	*	-
Pulaski	96	94	-	-	-	-	-	-
Putnam	234	218	*	*	*	*	*	-
Randolph	176	167	*	*	-	-	*	-
Ripley	341	325	11	5	*	*	*	*
Rush	89	79	8	*	*	-	18	*
St. Joseph	4,899	4,320	100	54	14	5	55	22
Scott	300	284	11	5	*	-	15	*
Shelby	155	144	*	*	*	*	*	*
Spencer	188	183	*	*	*	*	*	*
Starke	168	163	-	-	-	-	-	-
Steuben	203	198	*	*	-	-	-	-
Sullivan	127	123	-	-	-	-	*	-
Switzerland	54	53	-	-	-	-	-	-
Tippecanoe	1,451	1,371	16	9	*	*	9	*
Tipton	147	130	*	*	*	*	*	*
Union	110	95	7	*	*	*	*	*
Vanderburgh	2,044	1,924	34	17	5	*	11	6
Vermillion	144	138	6	*	*	-	*	*
Vigo	1,324	1,247	23	16	10	*	13	10
Wabash	185	177	*	*	*	*	*	-
Warren	65	63	-	-	-	-	-	-
Warrick	446	438	-	-	-	-	-	-
Washington	399	381	*	*	*	*	13	-
Wayne	1,239	1,087	32	15	7	*	7	5
Wells	243	218	12	5	*	*	6	6
White	328	316	*	*	-	-	*	-
Whitley	284	272	6	*	*	*	*	*
County Total	72,643	67,638	998	613	220	91	864	194
State of Indiana	73,902	68,868	1007	619	220	91	864	194

*Lake county totals for elevated tests and confirmed cases include children from East Chicago at or above 5 µg/dL

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