State of Illinois
Department of Public Health

Illinois Lead Program
2015 Annual Surveillance Report

December 2016 Edition

IDPH
Illinois Department of Public Health

IDPH
ILLINOIS DEPARTMENT OF PUBLIC HEALTH

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Dear Colleagues,

The Illinois Department of Public Health (IDPH) is pleased to present the 2015 annual surveillance report on childhood lead-poisoning prevention activities within the state. The goals of the Illinois Lead Program remain:

- Primary prevention
- Early detection
- Monitoring of children exposed to lead sources

Lead poisoning is one of the most prevalent, yet preventable, environmental health hazards that can affect any family, regardless of race or socioeconomic status. Illinois law requires reporting of all blood lead tests for children 15 years of age and younger.

There is no safe level of lead in the body. Children exposed to high lead levels have a greater probability of suffering lifelong complications that affect their ability to think, learn, or behave.

The burden of Illinois childhood lead poisoning remains one of the highest in the nation. Of the approximately 257,000 children tested in 2015, more than 10,000 had blood lead levels at the recommended federal reference value for public health intervention. Illinois provided case management services to lead-poisoned children with committed efforts to prevent or eliminate further lead exposure. Per Illinois law, environmental investigations were conducted to identify lead hazards that required mitigation.

This report is intended to serve as a standard public reference for legislators, decision-makers, community-based organizations, city, state, and federal agencies, as well as health professionals, researchers, and all who seek information on lead poisoning prevention in Illinois.

As we diligently work together to prevent childhood lead poisoning, the Illinois Lead Program looks forward to a continued collaboration with local health departments, its advisory council, and other partners at the federal, state, and local levels.

Very truly yours,

Nirav D. Shah

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To report the results of all blood lead tests or for more information about the elimination of childhood lead poisoning, contact the Illinois Lead Program at 866-909-3572 or 217-782-3517 or visit
http://www.dph.illinois.gov
The hearing impaired may dial 800-547-0466.

Scope of the Illinois Lead Program Surveillance

- *Estimate the extent of elevated blood-lead levels among Illinois children*
- *Monitor and promote the follow-up of children with elevated blood-lead levels*
- *Identify potential sources of lead exposure and other housing related health hazards*
- *Help allocate resources for lead poisoning prevention activities*
- *Provide information for education and policy*

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Acronyms and Symbols used in this Annual Report

ABLR	Adult Blood Lead Registry
ACOG	The American College of Obstetricians and Gynecology
BLL	Blood Lead Level
CDC	U.S. Centers for Disease Control and Prevention
CLIA	Clinical Laboratory Improvement Amendments
CLRQ	Childhood Lead Risk Questionnaire
CPSC	Consumer Product Safety Commission
FDA	U.S. Food and Drug Administration
IDPH	Illinois Department of Public Health
IPCB	Illinois Polluting Control Board
DHS	Illinois Department of Human Services
EBLL	Elevated Blood Lead Level
HFS	Illinois Department of Healthcare and Family Services
HHLPSS	Healthy Housing and Lead Poisoning Surveillance System
HP2020	Healthy People 2020
HUD	United States Department of Housing and Urban Development
IQ	Intelligence Quotient
OSHA	Occupational Safety and Health Administration
Program	Illinois Lead Program
STELLAR	Systematic Tracking of Elevated Lead Levels and Remediation
U.S. EPA	United States Environmental Protection Agency
µg/dL	Micrograms per deciliter
WIC	Women, Infants, and Children Nutrition Program
≥	Greater than or equal to

Definitions

Capillary blood draw: Blood samples collected by finger-stick method

Case Management: Any activity that involves coordinating, providing and overseeing the services required to reduce blood lead levels

Children: 6 years of age or younger at the time of testing except otherwise stated

Confirmed blood lead level: a blood lead level resulting from a single venous blood test

Intervention level: Confirmed blood lead level ≥10µg/dL

Evaluation: Administration of the CLRQ to the parent by a health care provider

Housing unit: A house, apartment, mobile home, group of rooms, or single room that is occupied or intended for occupancy (U.S. Census Bureau)

Percent of children tested: The number of children tested for blood lead divided by the population of children multiplied by 100 (U.S. Census Bureau)

Reference Value: Current recommended federal public health intervention level of ≥5µg/dL of lead in blood

Regulated facility: A residential building or child care facility

Test: The quantifiable result of a blood lead drawn on a child

Executive Summary

This is the Illinois Lead Program's 22nd annual surveillance report of the childhood lead poisoning prevention activities within the state from January through December 2015. This report is intended to serve as a standard reference for legislators, community-based organizations, city, state, federal agencies, as well as health care professionals, and researchers who seek information on lead poisoning prevention in Illinois. The report provides information on childhood lead poisoning prevention activities within the state by county, age, gender, race, and poverty status.

The Illinois Lead Poisoning Prevention Act [410 ILCS 45], passed by the Illinois General Assembly, authorized IDPH's Office of Health Protection, Division of Environmental Health to create the Lead Program to promulgate, administer, and enforce the Illinois Lead Poisoning Prevention Code (77 IL. Admin Code 845). IDPH, as well as approved local health departments, known as delegate agencies, administer and enforce the Act and Code. In 2015, IDPH had grant agreements with 84 delegate agencies to provide case management care for lead-poisoned children in 89 of 102 counties. Additionally, 16 of the delegate agencies also had grant agreements to provide environmental investigation services. In the 13 counties with no delegate agency agreements, IDPH provided case management services. In 2015, IDPH was responsible for environmental investigations for lead-poisoned children in 88 counties.

Problem: There is no safe level of lead in the body. Lead poisoning is one of the most prevalent and preventable environmental health hazards. Lead poisoning can affect the brain and the nervous systems of children and adults. Lead poisoning is known to contribute to violent behavior, learning disabilities, and developmental delays as well as a number of other negative health effects.

Lead Burden: The burden of Illinois childhood lead poisoning remains one of the highest in the nation. In 2015 alone, 10,322 Illinois children had blood lead levels (BLL) at the current recommended federal reference value of ≥5µg/dL, and 1,925 of those children met the current Illinois elevated blood lead level (EBLL) of ≥10µg/dL.

Children at highest risk for lead exposure include those with persistent oral behaviors; poor hygiene; poor nutrition (i.e., low iron and calcium); low-income households; children exposed to lead-containing products; and those residing in deteriorating pre-1978 housing units. Fifty-nine percent of pre-1978 housing units have lead-based paint prevalence and 41 percent have significant lead-based paint hazards.

Mission: The mission of the Program is to eliminate the incidence of childhood lead poisoning.

Vision: The vision of the Program is to provide a lead-safe environment for all children.

Illinois Lead Program 2015 Annual Surveillance Report

Goals:

- Prevent childhood lead poisoning through community education and public awareness campaigns
- Identify lead-poisoned children and provide prompt interventions to reduce BLLs and improve health and developmental outcomes

Funding: The program is currently supported by the Lead Poisoning Screening, Prevention, and Abatement Fund; Illinois State General Revenue Funds; U.S. Centers for Disease Control and Prevention (CDC); and the U.S. Environmental Protection Agency (U.S. EPA).

Highlights of 2015 Childhood Blood Lead Surveillance: According to the American Community Survey 2010-2014 5-year estimate by the Census Bureau, there were an estimated 1.1 million children 6 years of age and younger in Illinois.

- A total of 271,995 blood lead test results were received for 256,545 (23 percent) children 6 years of age and younger at time of testing. About 58 percent of children tested had at least one venous blood lead test.
- Approximately 16 percent of the blood specimens obtained from Illinois children were analyzed at IDPH laboratory.
- BLLs in children averaged 2.3µg/dL (geometric mean of 1.9µg/dL, median of 2.0µg/dL).
- One in 192 children tested had a confirmed EBLL.
- One in 25 children tested met the recommended federal reference value for public health intervention. Of the 10,322 (4.0 percent) children tested in 2015 with BLLs at the reference value:
  - 67 percent had a confirmatory venous test
  - 54 percent were males
  - 58 percent were 2 years of age or younger
  - 72 percent benefited from programs administered by Medicaid
  - 81 percent had lead levels in the 5 - 9µg/dL range and 19 percent had lead levels ≥10µg/dL
  - 4.3 percent were Black or African Americans compared to 2.5 percent Whites as tested by race

The burden of Illinois childhood lead poisoning remains one of the highest in the nation.
http://www.cdc.gov/nceh/lead/data/national.htm

Figure 1: Lead Program Logic Model: Input, Activities, Output and Outcome

STAKEHOLDERS	• **General Public** – Businesses, Churches, Hospitals, Housing Authority, Local Government, Local Health Departments, Organizations, Schools • **Federal Government** - Congress, CMS, EPA, HHS-CDC, HUD, USDA • **State Government** - Attorney General, DHS, ESBE, General Assembly, Governor, HFS, DCEO, IDFPR, IDPH, IEPA • **Public Universities** - Northwestern University, SIU, UIU-C, UIS, University of Chicago			
INPUTS	**ACTIVITIES**	**OUTPUT**	**OUTCOME**	**SHORT-TERM GOALS** Identify lead-poisoned children, provide prompt interventions, reduce blood lead levels, and improve health and developmental outcomes
• Strategic Plan• Illinois Lead Poisoning Elimination Advisory Council • Delegate Agencies • Local Health Departments • Financial Resources •HFS •DHS •Interagency Data Sharing Agreement	• Convene quarterly advisory council teleconferences • Execute subcommittees' goals and objectives • Establish and adhere to Intra/interagency agreements and MOUs • Partner with CDC, delegate agencies, local health departments and other community based organizations	• Partnership results in positive interventions for elimination of childhood lead poisoning especially among underserved and at-risk populations	• Mutual and strategic partnership established for collaboration and intervention	
• Illinois Lead Poisoning Prevention Code/Act • HP2020 • High risk ZIP codes, • Lead poisoning and Healthy Home Training Course by Department Staff • Public Health Home Visit Environmental Health Assessment forms, site visits chart reviews	• Primary: Regional education campaigns to train public health care providers and housing professionals about lead poisoning • Intervention: Identify and screen at-risk population • Contact lead-poisoned children for follow-up nurse home visit; Identify, assess, prevent, refer or remediate sources of lead hazards through housing rehabilitation by inspectors and risk assessors, identify and link family to available resources, develop case closure criteria, and chelate	• Vulnerable population identified and screened • Follow-up for medical case Management • Lead source remediation • Children's development and IQ improvement • More productive and quality lives	• Primary prevention and intervention plans available • Case managed • Become aware of home lead hazards and available intervention and resources	
• CENSUS • CDC surveillance support • ILP Lead Surveillance data • IT • CDC variable list • Staff • Interagency Agreement with HFS (Medicaid) and DHS (WIC) • Enterprise Data Warehouse • Adult Blood Lead Epidemiology and Surveillance (ABLES) • www.cdc.gov/nceh/lead • GIS Software • SAS	• Use STELLAR • Implement HHLPSS and collaborate with CDC for technical assistance • Train staff on HHLPSS • Send quarterly data to CDC • Mandate electronic data reporting • Clean data • Interface with other databases for Medicaid, WIC, CENSUS, Refugees, housing • Manage, analyze, and interpret data by region, county, city, and ZIP Codes • Identify emerging lead sources • Identify at-risk children and geographies• Create annual surveillance report for web site that includes blood tests, follow-ups, lead hazard identification and control and abatement activities • Send adult lead information to ABLES	• Trained staff • Surveillance system functional • Data cleaning plan • Surveillance report • Web site	• Surveillance report published on Department's Website serves as standard reference for legislators, community-based organizations, city, state and federal agencies, and health researchers	**LONG-TERM GOALS** Prevent childhood lead poisoning through community education and public awareness campaigns and intervention
	• Surveillance system collects address-specific and child-specific data • HHLPSS or equivalent adopted • Blood lead data reported to CDC and Website • Blood lead data is 100% electronic reporting • Data to CDC 95% error-free • Data-sharing agreement with housing, education, Medicaid and WIC • Annual blood lead reports available • Referrals to appropriate agencies • Follow-up effective • Justified high-risk designation • Lead level decreases • Professional action for underserved at-risk population	• Timeliness and efficacy of case management services • Strategic plan to remove or reduce lead sources • Inspectors and risk assessors ensure safe living environment	• Program evaluation procedures/ measures	
• Existing IL statutory laws, regulations, and policies on lead	• Identify and partner with regulatory authorities to develop plan of action to enforce housing and health codes (HUD, EPA) • Review and enact electronic reporting of blood and environmental lead tests regulations • Identify and address pertinent policies, procedures and regulations that control or eliminate lead sources in children's environment • Identify and plan reinforcement	• Improved compliance and enforcement of housing and health codes • Improved compliance with federal, state and local laws	• Housing and health codes enforcement plan	**IMPACT** Eliminate elevated blood lead levels in children and reduce lead hazard exposures

Sources of Lead Exposure

Figure 2: Sources of Lead Exposure

Dust from deteriorated or disturbed lead-based paint in homes is the primary source of lead poisoning. Children are most likely to ingest lead dust through hand-to-mouth activities. Adults are most likely to inhale lead via airborne emissions resulting from occupational exposure, hobbies, and home renovations. Improper post-work hygiene, smoking, eating, or drinking in work areas may increase lead exposure (Figure2).

There is also evidence that children may be exposed through maternal means, such as during prenatal development or via breast milk consumption (from a lead-exposed mother).

Consumer products such as supplements, remedies, foods, spices, cosmetics, toys, jewelries, charms, amulets, and ceramic wares may contain high lead levels detrimental to health. All manufactured children's products are limited to less than 100 parts per million of total lead content in accessible parts and less than 0.009 percent (90 parts per million) lead in paint and surface coatings.

For more information about sources of lead exposure, refer to the following websites:
http://www.atsdr.cdc.gov/csem/csem.asp?csem=7&po=6
http://www.epa.gov/lead/pubs/leadpdfe.pdf

The U.S. Food and Drug Administration is warning consumers not to use "Bentonite Me Baby - Betonite Clay" by Alikay Naturals because of a potential lead poisoning risk.
http://www.fda.gov/Drugs/DrugSafety/ucm483838.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery

Water: According to CDC, lead found in tap water usually comes from the corrosion of metal water taps, older metal interior water pipes, or from the solder that connects pipes to one another in the plumbing system. When water sits in lead pipes for an extended period, the lead may leach into the water supply.

Lead content in drinking water may be reduced by:

- Anti-corrosion treatment
- Lead service line replacement
- Water source testing
- Cold water use for cooking or drinking; hot water is likely to have higher levels of lead than cold water in homes built before 1986

Regulations to reduce lead in tap water include:

- Safe Drinking Water Act (***http://www.epa.gov/sdwa***)
- U.S. EPA Lead and Copper Rule (***http://www.epa.gov/dwreginfo/lead-and-copper-rule***)
- Primary Drinking Water Standards for Public Water Supplies under the authority of the Safe Drinking Water Act in Illinois (35 IAC Part 611 of the Illinois Polluting Control Board Regulations which also includes the Lead/Copper Rule) (***http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.aspx***)
- The Public Area Sanitary Code, 77 IAC 895, covers any residential properties that are not a public water supply or a single family owner occupied residence. It includes a maximum contaminant level for lead. ***http://www.ilga.gov/commission/jcar/admincode/077/07700895sections.html***

For more information about lead in drinking water, refer to the following websites:

- IEPA/IDPH - Preliminary Report on Lead in Public Water Systems ***http://dph.illinois.gov/sites/default/files/publications/publicationsohpiepa-preliminary-report-lead-pws.pdf***
- IEPA ***http://water.epa.state.il.us/dww/Maps/Map_Template.jsp***
- CDC ***http://www.cdc.gov/nceh/lead/tips/water.htm***
- U.S. EPA
  - ***http://www.epa.gov/safewater/dwinfo/index.html***
  - ***https://safewater.zendesk.com/hc/en-us***
- National Ground Water Association ***http://www.wellowner.org***
- Environmental Science and Technology ***http://pubs.acs.org/doi/abs/10.1021/es4003636***

High-Risk ZIP Codes for Pediatric Blood Lead Poisoning

An amendment to the Act required IDPH to designate areas of the state where children through 6 years of age are considered to be at high-risk for lead exposure and areas where children are considered to be at low risk for such lead exposure.

The high-risk ZIP codes was based on housing data and family economic status (200 percent poverty and below) obtained from Census. The proportion of housing units estimated to have a lead hazard by ZIP code was determined based on the following classification:

Pre-1940 = 68 percent with lead hazards
1940 to 1959 = 43 percent with lead hazards
1960 to 1977 = 8 percent with lead hazards
1978 to 1998 = 3 percent with lead hazards

Source: Table 3.4. National Survey of Lead and Allergens in Housing, 2001.

The RANK procedure with a double weight on the housing data was used to make determination for each ZIP code in Illinois. Each variable was assigned scores between 1 and 9 (1 = lowest and 9 = highest). The summed scores by ZIP codes ranged from 3 to 27. Ranking was performed with and without Chicago. The procedure to determine high- and low-risk ZIP codes highly correlated with actual EBLL prevalence data (R2=0.92). Based on current and previous analysis, all of Chicago was considered high risk.

High risk ZIP codes were developed as a tool to enable health care providers increase testing for childhood lead poisoning for the following reasons:

- ZIP codes were the smallest geographic entities readily available at the time
- Health care providers and patients could relate an address to a ZIP code better than relating an address to a census tract or census block

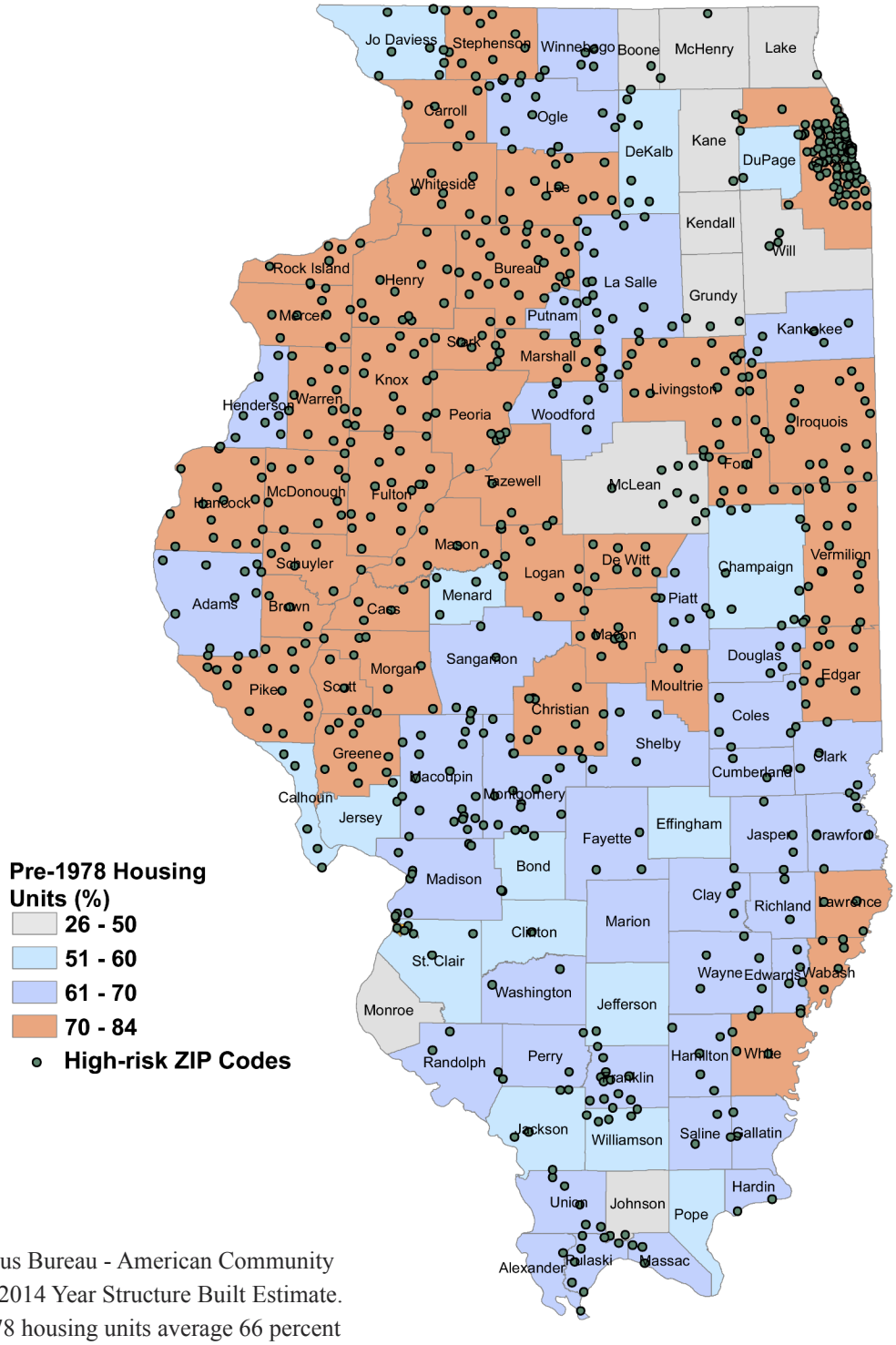
Limitations: ZIP codes constantly change for efficient mail delivery by the postal service. Census tract and census blocks may change only after a census is conducted (usually after every 10 years) making them better indicators of high-risk areas.

- The short-term goal was to use our most available resource (ZIP codes) to determine high-risk areas for lead in Illinois.
- The long-term goal is to establish an efficient data cleaning procedure for addresses before developing high-risk areas by block or tract to reflect the lowered federal recommended levels for public health intervention.
- Approximately 5.4 percent of children tested in the high-risk ZIP codes had BLLs ≥5 µg/dL compared to 2.3 percent in the low-risk ZIP codes, and approximately 1.0 percent of children tested in the high-risk ZIP codes had BLLs ≥10 µg/dL compared to 0.4 percent in the low-risk ZIP codes.

Table 1: High-Risk ZIP Codes for Pediatric Blood Lead Poisoning

Adams	61849	61750	61482	61413	61458	62643	**McHenry**	61603	62289	61876
62301	61851	61777	61484	61419	61467	62666	60034	61604	**Saline**	61883
62320	61852	61778	61501	61434	61474	62671	**McLean**	61605	62930	**Wabash**
62324	61862	61882	61519	61443	61485	**Macon**	61701	61606	62946	62410
62339	61872	**DeKalb**	61520	61468	61489	62514	61720	**Perry**	**Sangamon**	62852
62346	**Christian**	60111	61524	61490	61572	62521	61722	62832	62625	62863
62348	62083	60129	61531	**Iroquois**	**Lake**	62522	61724	62997	62689	**Warren**
62349	62510	60146	61542	60911	60040	62523	61728	**Piatt**	62703	61412
62365	62517	60550	61543	60912	**LaSalle**	62526	61730	61813	**Schuyler**	61417
Alexander	62540	**Douglas**	61544	60924	60470	62537	61731	61830	61452	61423
62914	62546	61930	61563	60926	60518	62551	61737	61839	62319	61435
62988	62555	61941	**Gallatin**	60930	60531	**Macoupin**	61770	61855	62344	61447
Bond	62556	61942	62934	60931	61301	62009	**Menard**	61929	62624	61453
62273	62557	**DuPage**	**Greene**	60938	61316	62033	62642	61936	62639	61462
Boone	62567	60519	62016	60945	61321	62069	62673	**Pike**	**Scott**	61473
61038	62570	**Edgar**	62027	60951	61325	62085	62688	62312	62621	61478
Brown	**Clark**	61917	62044	60953	61332	62088	**Mercer**	62314	62663	**Washington**
62353	62420	61924	62050	60955	61334	62093	61231	62323	62694	62214
62375	62442	61932	62054	60966	61342	62626	61260	62340	**Shelby**	62803
62378	62474	61933	62078	60967	61348	62630	61263	62343	62438	**Wayne**
Bureau	62477	61940	62081	60968	61354	62640	61276	62345	62534	62446
61312	62478	61944	62082	60973	61358	62649	61465	62352	62553	62823
61314	**Clay**	61949	62092	**Jackson**	61364	62672	61466	62355	**Stark**	62843
61315	62824	**Edwards**	**Grundy**	62927	61370	62674	61476	62356	61421	62886
61322	62879	62476	60437	62940	61372	62685	61486	62357	61426	**White**
61323	**Clinton**	62806	60474	62950	**Lawrence**	62686	**Monroe**	62361	61449	62820
61328	62219	62815	**Hamilton**	**Jasper**	62439	62690	None	62362	61479	62821
61329	**Coles**	62818	62817	62432	62460	**Madison**	**Montgomery**	62363	61483	62835
61330	61931	**Effingham**	62828	62434	62466	62002	62015	62366	61491	62844
61337	61938	None	62829	62459	**Lee**	62048	62019	62370	**Stephenson**	62887
61338	61943	**Fayette**	62859	62475	60553	62058	62032	**Pope**	61018	**Whiteside**
61344	62469	62458	**Hancock**	62480	61006	62060	62049	None	61032	61037
61345	**Cook**	62880	61450	**Jefferson**	61031	62084	62051	**Pulaski**	61039	61243
61346	**All Chicago**	62885	62311	62883	61042	62090	62056	62956	61044	61251
61349	**ZIP Codes**	**Ford**	62313	Jersey	61310	62095	62075	62963	61050	61261
61359	60043	60919	62316	62030	61318	**Marion**	62077	62964	61060	61270
61361	60104	60933	62318	62063	61324	None	62089	62976	61062	61277
61362	60153	60936	62321	**Jo Daviess**	61331	**Marshall**	62091	62992	61067	61283
61368	60201	60946	62330	61028	61353	61369	62094	**Putnam**	61089	**Will**
61374	60202	60952	62334	61075	61378	61377	62538	61336	**Tazewell**	60432
61376	60301	60957	62336	61085	**Livingston**	61424	**Morgan**	61340	61564	60433
61379	60302	60959	62354	61087	60420	61537	62601	61363	61721	60436
Calhoun	60304	60962	62367	**Johnson**	60460	61541	62628	**Randolph**	61734	**Williamson**
62006	60305	61773	62373	62908	60920	**Mason**	62631	62217	**Union**	62921
62013	60402	**Franklin**	62379	62923	60921	62617	62692	62242	62905	62948
62036	60406	62812	62380	**Kane**	60929	62633	62695	62272	62906	62949
62070	60456	62819	**Hardin**	60120	60934	62644	**Moultrie**	**Richland**	62920	62951
Carroll	60501	62822	62919	60505	61311	62655	61937	62419	62926	**Winnebago**
61014	60513	62825	62982	**Kankakee**	61313	62664	**Ogle**	62425	**Vermilion**	61077
61051	60534	62874	**Henderson**	60901	61333	62682	61007	**Rock Island**	60932	61101
61053	60546	62884	61418	60910	61740	**Massac**	61030	61201	60942	61102
61074	60804	62891	61425	60917	61741	62953	61047	61236	60960	61103
61078	**Crawford**	62896	61454	60954	61743	**McDonough**	61049	61239	60963	61104
Cass	62433	62983	61460	60969	61769	61411	61054	61259	61810	**Woodford**
62611	62449	62999	61469	**Kendall**	61775	61416	61064	61265	61831	61516
62618	62451	**Fulton**	61471	None	**Logan**	61420	61091	61279	61832	61545
62627	**Cumberland**	61415	61480	**Knox**	62512	61422	**Peoria**	**St. Clair**	61833	61570
62691	62428	61427	**Henry**	61401	62518	61438	61451	62201	61844	61760
Champaign	**DeWitt**	61431	61234	61410	62519	61440	61529	62203	61848	61771
61815	61727	61432	61235	61414	62548	61470	61539	62204	61857	
61816	61735	61441	61238	61436	62543	61475	61552	62205	61865	
61845	61749	61477	61274	61439	62635	62374	61602	62220	61870	

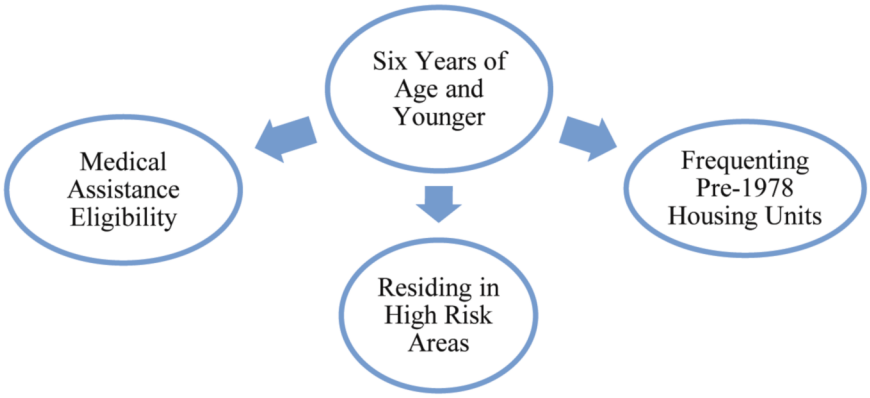
Figure 3: Percent of Pre-1980 Housing Units by Illinois County and High-Risk ZIP Codes for Childhood Lead Poisoning



Source: Census Bureau - American Community Survey 2010-2014 Year Structure Built Estimate. Note: Pre-1978 housing units average 66 percent by Illinois county. Created 12/15/2016.

Children at Highest Risk for Lead Poisoning

Figure 4: Children at Highest Risk for Blood Lead Exposure



Young children and those with persistent oral behaviors: Lead ingestion occurs from hand-to-mouth activities after exposure to surfaces with lead-contaminated dust (e.g., crawling on the floor, playing near a window). In 2015, of the 256,545 children tested, 1,925 (0.8 percent) had BLLs of ≥ 10µg/dL and 1,341 (70 percent) were confirmed with a venous blood test. Also, 10,322 (4.0 percent) had BLLs of ≥ 5µg/dL and 6,872 (67 percent) were confirmed with a venous blood test.

- **Children in low-income households:** Among Illinois children enrolled in Medicaid, WIC, Head Start, and All Kids in 2015, 0.9 percent had BLLs of ≥10µg/dL and 4.4 percent had BLLs of ≥5µg/dL.
- **Children exposed to imported products containing lead:** Such products include imported toys, cosmetics (surma, kohl), medicine (folk remedies), pottery, candies, and spices (***https://www.cpsc.gov/en/***).
- **Children with compromised nutritional status:** Iron and calcium deficiencies contribute to increased lead absorption.
- **Lead prevalence and pre-1978 housing:** Homes in deteriorated condition continue to be the leading cause of lead poisoning cases in Illinois. Based on a national survey, 59 percent of pre-1978 Illinois housing units have a prevalence of lead-based paint and 41 percent have significant lead-based paint hazards (Table 2).

For additional information

. . . in 6-year-old children, every five micrograms per deciliter of increase in blood lead levels increased the risk of being arrested for a violent crime as a young adult by almost 50 percent . . .
http://www.theepochtimes.com/n3/2145046-lead-poisoning-a-significant-cause-of-inner-city-crime-say-researchers/

Table 2: Estimates of Pre-1978 Housing Units with Lead Hazards in Illinois

Year Structure Built	Illinois Estimate	Prevalence of Lead-based Paint[2]		Significant Lead-based Paint Hazard[1]	
		% with Lead	Illinois Units with Lead	% with Lead	Illinois Units with Lead Hazards
1960 to 1977	1,237,203	23.8	294,454	7.7	95,265
1940 to 1959	1,037,396	73.7	764,561	48.7	505,212
Pre-1940	1,201,809	82.6	992,694	68.5	823,239
Pre-1978	**3,476,408**	**59.0**	**2,051,709**	**41.0**	**1,423,716**

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-year estimate Year Structure Built Table B25034 , [1]Table 5-1 and [2]Table 4-1, American Healthy Homes Survey, 2011: ***http://portal.hud.gov/hudportal/documents//huddoc?id=AHHS_REPORT.pdf***

As required by the Act (410 ILCS 45/7), all health care providers shall report blood lead test results to IDPH. If a child has multiple tests, the highest venous result is selected. If there is no venous test on a child, the peak capillary blood lead result is selected.

While the current acceptable error range is ±4µg/dL, most laboratories that do blood lead analyses perform at an error range within ±2µg/dL. The portable desktop blood-lead analyzers operate within a ±3µg/dL error range.

Tables 2 and 3 indicate that 58 percent of Illinois children tested were two years of age or younger and accounted for 62 percent of the children with BLLs ≥10µg/dL. About 45 percent of Illinois counties and/or delegate agencies had blood lead prevalence above the state level ranging from 0.9-4.6 percent.

Positively, 18 counties/delegate agencies that tested between 23-597 children had no child younger than 3 years of age with BLLs ≥10µg/dL.

Deteriorated lead-based paint remains the primary source of lead exposure to children in Illinois. Approximately 66 percent of Illinois housing units were built prior to the residential lead paint ban of 1978 (Table 3).

A blood lead level of ≥10µg/dL is the current level for public health intervention in Illinois.

Table 3: Pre-1978 Occupied Housing Units and Children Two Years of Age and Younger with Blood Lead Levels at the Federal and Illinois Intervention Levels by County or Delegate Agencies: 2015

Illinois/County/City/ Delegate Agencies	Total Housing Units (N)	Pre-1978 Housing Units Estimates	All BLLs of Children 2 Years of Age or Younger at Time of Testing		
		(%)[a]	Tested (N)	Tested ≥ 5µg/dL (%)	Tested ≥ 10µg/dL (%)
Illinois	**5,299,433**	**66**	**160,354**	**3.7**	**0.8**
Adams	29,907	70	986	10.2	3.2
Alexander	3,977	69	65	9.2	4.6
Bond	7,086	56	204	3.9	1.5
Boone	19,970	45	585	2.4	0.7
Brown	2,456	71	52	7.7	0.0
Bureau	15,683	79	289	6.2	2.8
Calhoun	2,833	59	29	10.3	0.0
Carroll	8,413	71	108	3.7	0.0
Cass	5,807	74	201	5.0	1.0
Champaign	88,355	55	1,756	1.8	0.5
Christian	15,536	75	337	5.0	0.9
Clark	7,746	66	213	4.2	0.5
Clay	6,384	62	206	8.7	0.5
Clinton	15,443	54	318	1.6	0.3
Coles	23,479	69	673	6.5	1.2
Cook w/o Chicago	986,035	71	22,978	2.5	0.5
Chicago	1,190,998	81	60,915	3.6	0.8
Crawford	8,655	70	176	8.5	0.6
Cumberland	4,875	66	130	3.1	0.8
DeKalb	41,034	53	693	2.9	0.7
DeWitt	7,519	73	125	7.2	0.8
Douglas	8,374	69	176	4.0	1.1
DuPage	356,625	52	5,062	1.4	0.2
Edgar	8,778	74	159	5.7	0.6
Edwards	3,174	69	56	3.6	0.0
Effingham	14,675	56	309	5.8	0.6
Fayette	9,279	66	297	3.0	1.0
Ford	6,277	78	130	9.2	2.3
Franklin	18,622	68	320	1.6	0.9
Fulton	16,178	80	238	10.5	1.3
Gallatin	2,730	65	71	1.4	0.0
Greene	6,371	73	177	9.6	1.1
Grundy	20,157	46	358	4.5	1.4
Hamilton	4,079	63	79	5.1	1.3
Hancock	9,232	75	218	11.0	3.2
Hardin	2,302	63	20	10.0	0.0
Henderson	3,821	70	43	4.7	0.0
Henry	22,130	78	442	8.8	1.6
Iroquois	13,429	74	239	9.2	0.8
Jackson	28,634	57	653	1.4	0.3
Jasper	4,335	63	71	2.8	0.0
Jefferson	16,879	57	396	4.3	1.3
Jersey	9,952	54	299	4.0	0.7

Illinois/County/City/ Delegate Agencies	Total Housing Units (N)	Pre-1978 Housing Units Estimates	All BLLs of Children 2 Years of Age or Younger at Time of Testing		
		(%)[a]	Tested (N)	Tested ≥ 5µg/dL (%)	Tested ≥ 10µg/dL (%)
Jo Daviess	13,578	60	158	7.6	1.3
Johnson	5,566	49	64	6.3	3.1
Kane	182,852	49	6,904	3.3	0.8
Kankakee	45,189	62	1,477	3.2	0.8
Kendall	40,747	26	467	1.7	0.2
Knox	23,960	81	615	12.8	3.3
Lake	260,834	47	4,724	1.3	0.2
LaSalle	49,871	70	891	5.5	1.1
Lawrence	5,807	76	207	3.9	1.4
Lee	15,057	74	90	6.7	1.1
Livingston	15,851	71	367	4.6	0.0
Logan	11,898	80	282	4.6	2.1
McDonough	14,407	71	301	10.6	3.3
McHenry	116,534	39	1,117	2.1	0.3
McLean	70,485	50	2,413	3.5	0.9
Macon	50,424	74	1,166	6.6	2.0
Macoupin	21,547	68	460	5.2	1.7
Madison	117,648	65	2,635	2.6	0.7
Marion	18,212	65	558	4.1	0.9
Marshall	5,895	74	152	5.3	0.7
Mason	7,049	79	163	12.3	4.3
Massac	7,093	61	55	3.6	0.0
Menard	5,659	60	72	1.4	0.0
Mercer	7,371	79	185	8.1	2.2
Monroe	13,598	38	262	4.6	0.8
Montgomery	12,678	69	335	4.8	0.3
Morgan	15,462	71	379	7.7	1.1
Moultrie	6,295	72	143	2.8	0.7
Ogle	22,566	63	245	3.3	0.8
Peoria	83,344	73	2,366	7.9	2.1
Perry	9,439	66	214	5.6	0.5
Piatt	7,310	67	97	4.1	3.1
Pike	7,939	76	196	7.7	1.0
Pope	2,664	60	18	11.1	0.0
Pulaski	3,144	69	41	2.4	0.0
Putnam	3,095	65	23	0.0	0.0
Randolph	13,745	68	312	3.8	0.6
Richland	7,514	65	169	11.2	0.6
Rock island	65,820	78	1,954	8.8	2.2
St. Clair w/o ESHD	91,144	52	1,750	3.0	0.3
Saline	11,644	66	332	1.5	0.3
Sangamon	90,312	61	2,010	6.2	1.3
Schuyler	3,443	71	66	9.1	3.0
Scott	2,449	75	70	10.0	0.0
Shelby	10,461	70	197	4.1	2.0
Stark	2,666	84	87	13.8	2.3

Illinois/County/City/ Delegate Agencies	Total Housing Units (N)	Pre-1978 Housing Units Estimates	All BLLs of Children 2 Years of Age or Younger at Time of Testing		
		(%)[a]	Tested (N)	Tested ≥ 5µg/dL (%)	Tested ≥ 10µg/dL (%)
Stephenson	22,005	75	698	14.8	4.4
Tazewell	57,743	71	1,552	2.8	1.0
Union	7,915	65	160	2.5	0.6
Vermilion	36,137	79	953	3.3	0.7
Wabash	5,549	71	152	6.6	0.0
Warren	7,686	84	237	10.5	0.4
Washington	6,561	67	107	5.6	1.9
Wayne	7,938	63	201	12.4	0.5
White	7,145	71	172	7.6	1.2
Whiteside	25,759	77	713	4.2	1.1
Will	238,521	37	5,512	2.5	0.4
Williamson	30,602	57	520	2.3	0.2
Winnebago	125,819	64	3,931	4.7	1.2
Woodford	15,252	62	447	2.0	0.0
Egyptian[1]	21,519	68	575	3.3	0.5
ESHD[2]	26,311	81	1,699	5.1	0.7
Evanston	31,771	83	1050	2.2	0.6
Oak Park	23,872	91	772	3.2	0.9
Skokie	24,516	84	597	1.3	0.0
Southern Seven[3]	32,661	62	423	5.0	1.4
Stickney	2,690	89	55	1.8	1.8

Source: [a]Pre-1978 housing unit was estimated from U.S. Census Bureau, 2010-2014 5-Years American Community Survey, Table B25034-Year Structure Built

[1] Egyptian Counties: Galatin, Saline, and White

[2] ESHD or East Side Health District includes the cities of Alorton, Brooklyn, Cahokia, Centreville, East St. Louis, Lovejoy, National Stock Yards, Sauget, Washington Park and Fairmont City.

[3] Southern Seven Counties: Alexander, Hardin, Johnson, Massac, Pope, Pulaski and Union.

A child was counted only once for each year in which he or she was tested or had a follow-up test. Counties and delegate agencies were ranked based on the percentages of pre-1978 housing units and children tested in 2015 with EBLs.

Ranking of Counties or Delegate Agencies for Childhood Lead Poisoning Risks

Rankings were based on the presence of more than 50 children, two years of age or younger, who were tested for lead, the percentage of pre-1978 housing units, and percentage of children tested with blood lead level ≥10µg/dL.

25 highest-risk health agency jurisdictions: Knox County, Stark County, Mason County, Stickney, Stephenson County, Bureau County, Logan County, Mercer County, Hancock County, Ford County, Rock Island County, Fulton County, Henry County, Macon County, McDonough County, Lawrence County, Village of Oak Park, Peoria County, Adams County, Schuyler County, Alexander County, Whiteside County, City of Chicago, Pike County, and Shelby County (Childhood blood lead prevalence of ≥10µg/dL ranged from 0.8 - 4.6 percent and percentage of pre-1978 housing units ranged from 69-91)

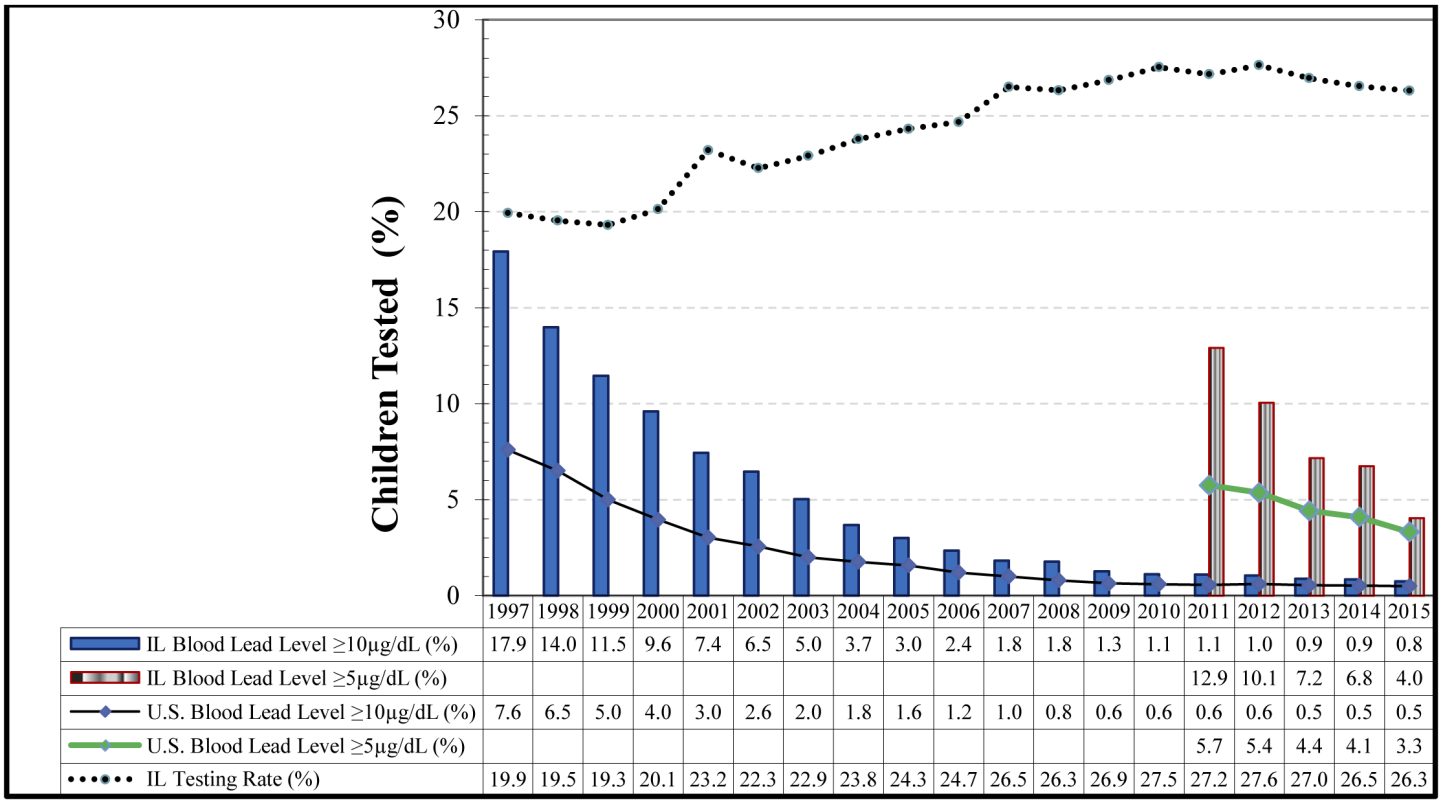
10 lowest-risk health agency jurisdictions: Kendall County, Calhoun County, Pope County, Menard County, Lake County, McHenry County, Massac County, Will County, DuPage County, and Woodford County (Childhood blood lead prevalence of ≥10µg/dL ranged from 0.0 – 0.4 percent and percentage of pre-1978 housing units ranged from 26-62)

Illinois and U.S. Childhood Blood Lead Prevalence: 1997 - 2015

Illinois continues to make progress addressing childhood blood lead poisoning. In 2015, there were 1,925 Illinois children, 6 years of age and younger identified with a BLL ≥10µg/dL, and 1,341 (70 percent) of them were confirmed with a venous test. Of those confirmed, 514 were tested for the first time in 2015.

Figure 5 represents the percentage of children five years of age and younger at time of testing with BLL ≥10µg/dL and ≥5µg/dL, respectively. Illinois BLLs ≥10µg/dL has significantly decreased from 17.9 percent in 1997 to 0.8 percent in 2015.

Figure 5: Illinois and U.S. Children with Blood Lead Levels at the Federal Reference Value and the Illinois Public Health Intervention Level 1997 – 2015



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
IL Blood Lead Level ≥10µg/dL (%)	17.9	14.0	11.5	9.6	7.4	6.5	5.0	3.7	3.0	2.4	1.8	1.8	1.3	1.1	1.1	1.0	0.9	0.9	0.8
IL Blood Lead Level ≥5µg/dL (%)															12.9	10.1	7.2	6.8	4.0
U.S. Blood Lead Level ≥10µg/dL (%)	7.6	6.5	5.0	4.0	3.0	2.6	2.0	1.8	1.6	1.2	1.0	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5
U.S. Blood Lead Level ≥5µg/dL (%)															5.7	5.4	4.4	4.1	3.3
IL Testing Rate (%)	19.9	19.5	19.3	20.1	23.2	22.3	22.9	23.8	24.3	24.7	26.5	26.3	26.9	27.5	27.2	27.6	27.0	26.5	26.3

Source: Illinois Lead Program Surveillance Data, 1997-2015; the United States average is based on data reported by the CDC at ***http://www.cdc.gov/nceh/lead/data/national.htm***. Please note: In order to compare with national data compiled by CDC this figure only includes children five years of age and younger. Venous BLLs ≥10µg/dL triggers a public health intervention in Illinois.

Illinois and U.S. Blood Lead Testing Activities: 1997 - 2015

The only way to know that a child is lead-poisoned is to perform a blood lead test. The Act requires children 6 years of age and younger to be tested for lead poisoning if they reside in an area defined as high-risk; or evaluated for risk using the Childhood Lead Risk Questionnaire (CLRQ) if they reside in areas defined as low-risk by IDPH. IDPH is authorized to maintain a system for the collection and analysis of childhood blood lead data.

Lead testing is required for:

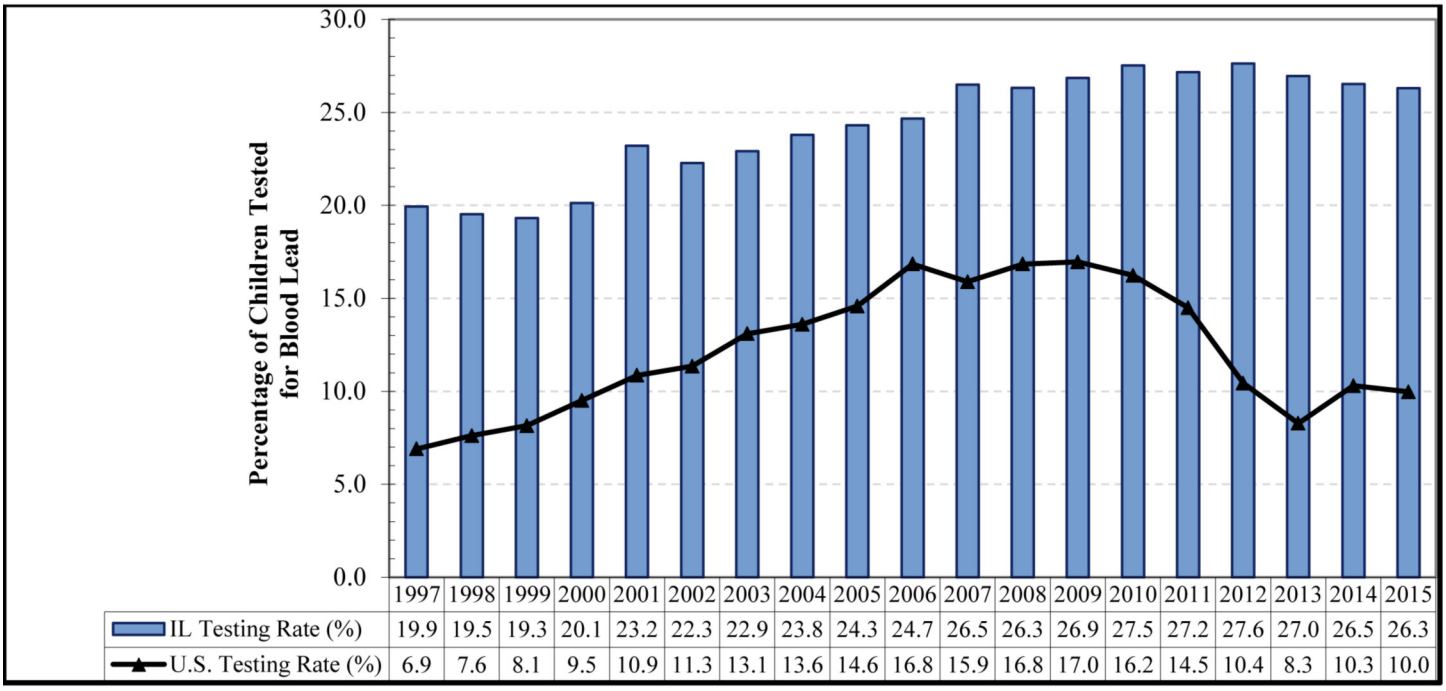
- Children residing in high-risk areas for lead exposure or who answer "YES" or "I DO NOT KNOW" to any question on the CLRQ
- Children receiving services from Medicaid, Head Start, All Kids, Women, Infants and Children (WIC)

Evaluation is performed:

- Using CLRQ
- On children before they attend a licensed day care, school, or kindergarten as required by law

The testing rate for blood lead in Illinois and U.S. children is shown below on Figure 6. Based on the population of children five years of age or younger, the CDC reported a national blood lead testing rate of 10 percent for 2015 compared to a 26.3 percent testing rate in Illinois in the same year.

Figure 6: Illinois and U.S. Blood Lead Testing Rates for Children Five Years of Age and Younger: 1997-2015



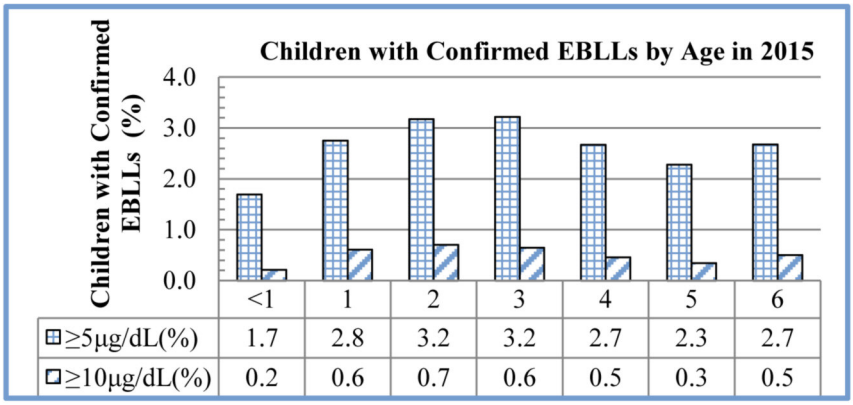
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
IL Testing Rate (%)	19.9	19.5	19.3	20.1	23.2	22.3	22.9	23.8	24.3	24.7	26.5	26.3	26.9	27.5	27.2	27.6	27.0	26.5	26.3
U.S. Testing Rate (%)	6.9	7.6	8.1	9.5	10.9	11.3	13.1	13.6	14.6	16.8	15.9	16.8	17.0	16.2	14.5	10.4	8.3	10.3	10.0

Source: Illinois Lead Program Surveillance Data, 1997-2015; Illinois population of five years of age and younger from CDC WONDER; United States average is based on data reported to CDC at: ***http://www.cdc.gov/nceh/lead/data/national.htm***. CDC only reported blood lead data for children 5 years of age or younger so this figure only includes children of that age group.

Blood Lead Levels and Age

Illinois law requires physicians to perform a blood lead test on all children 6 years of age or younger who live in high-risk areas. All of the city of Chicago is defined as a high-risk area for childhood blood-lead poisoning. The percentage of Illinois children at the intervention level all peaked at approximately 2-3 years of age (Figure 7 and Table 4).

Figure 7: Children with Confirmed Blood Lead Levels for Public Health Intervention by Age in 2015



A child must be evaluated for lead risk, if residing in a low-risk area. Illinois law also requires parents or legal guardians to provide a statement from a physician or health care provider that the child has been tested or evaluated for lead poisoning before attending a licensed daycare, kindergarten, or school.

Source: Illinois Lead Program Surveillance Data, 2015

Table 4: Children Tested for Blood Lead by **Age Group** from January 1 to December 31, 2015

Age (Years)	Estimated Population[a]	Children Tested				
		All Children		<5 µg/dL	≥5 µg/dL	≥10 µg/dL
		n	%	%	%	%
< 3	470,609	160,354	34.1	96.3	3.7	0.8
3 - 6	646,502	96,191	14.9	95.4	4.6	0.7
≤ 6	1,117,111	256,545	23.0	96.0	4.0	0.8
7 - 15	1,511,999	9,359	0.6	95.9	4.1	0.8

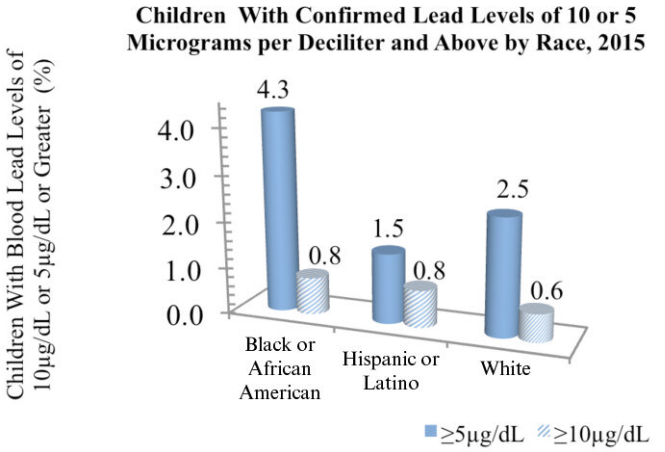
Source: Illinois Department of Public Health - Illinois Lead Program Surveillance Data 2015. Data includes one venous blood lead test result per child by age; if there was no venous test then the highest capillary test results were used. [a]Population data compiled from bridged-race Vintage 2015 (2010-2015) post-censal population estimates (released by NCHS June 28, 2016) accessed at ***http://wonder.cdc.gov/bridged-race-v2015.html*** on December 14, 2016.

A total of 9,358 children 7 to 15 years of age were also tested for blood lead in 2015. Among the 79 children in this age group with EBLLs ≥10µg/dL, 81 percent were confirmed by a venous test. Of the 384 children in this age group with BLLs ≥5µg/dL, 81 percent were confirmed by a venous test.

Blood Lead Levels and Race

Figure 8 and Table 5 indicate that Black/ African American children are disproportionately burdened by lead poisoning compared to their White or Hispanic counterparts.

Figure 8: Childhood BLLs by **Race** in 2015



Source: Illinois Lead Program Surveillance Data, 2015

While the information about a child's race and ethnicity is requested in the mandatory reporting process, much of this data are unreported. Through an interagency data agreement, Medicaid children tested for lead poisoning were matched against the childhood lead database to populate the race field. Based on the Uniform Racial Classification Act (20 ILCS 50/5), more than 58 percent of the 256,545 children tested in 2015 were racially classified. Race status recorded was for 31 percent Whites, 20 percent Blacks or African Americans and 3.7 percent Hispanic or Latino. Of the 51,825 Black or African American children identified, 0.8 percent had confirmed BLLs ≥10µg/dL. Of 79,684 White children identified as tested, approximately 0.6 percent had confirmed BLLs ≥10µg/dL. Of 9,529 Hispanic or Latino children identified, approximately 0.8 percent had confirmed BLLs ≥10µg/dL.

Table 5: Children Tested for Blood Lead by **Race/Ethnicity** - January 1 to December 31, 2015

Racial Classification	Estimated Population[a]	Children Tested by Race in 2015										Geomean Blood Lead Level, µg/dL
		Total Tested		<5µg/dL		≥5µg/dL			≥10µg/dL			
		n	%	n	%	n		%	n		%	
						Capillary	Venous		Capillary	Venous		
Black or African American	183,694	51,825	28.2	48,761	94.1	815	2,249	5.9	183	404	1.1	2.0
White	580,389	79,684	13.7	76,273	95.7	1,444	1,967	4.3	232	488	0.9	1.9
Hispanic or Latino	274,056	9,529	3.5	9,091	95.4	297	141	4.6	90	76	1.7	1.3
Others[b]	65,658	6,510	9.9	6,185	95.0	105	220	5.0	30	103	2.0	
Unidentified[c]		108,997		105,913	97.2	789	2,295	2.8	49	271	0.3	
Total	1,103,797	256,545	23.2	246,223	96.0	3,450	6,872	4.0	584	1,342	0.8	1.9

Source: Illinois Department of Public Health - Illinois Lead Program Surveillance Database, 2015. [a]Population data compiled from bridged-race Vintage 2015 (2010-2015) post-censal population estimates (released by NCHS June 28, 2016), accessed at ***http://wonder.cdc.gov/bridged-race-v2015.html*** on July 25, 2016. Data includes one venous blood lead test result per year; if there was no venous test, then the highest capillary test results were used. Racial classifications with fewer numbers reported were suppressed to prevent identification of individuals; [b]includes other self-identified racial classifications and; [c]children whose racial information were unavailable.

As Table 6 illustrates, 51 percent of the children tested in 2015 were males and 54 percent of children with lead levels ≥10µg/dL were males. Approximately 1.2 percent of children tested had no gender data collected and are classified as gender unidentified.

Table 6: Children Tested for Blood Lead by **Gender** - January 1 to December 31, 2015

Gender	Estimated Population[a]	Children Tested in 2015										Geomean Blood Lead Level, µg/dL
		Total Tested		<5µg/dL		≥5µg/dL			≥10µg/dL			
		n	%	n	%	n		%	n		%	
						Capillary	Venous		Capillary	Venous		
Female	541,052	123,799	22.9	119,091	96.2	1,523	3,185	3.8	262	611	0.7	1.91
Male	562,745	129,562	23.0	124,037	95.7	1,878	3,647	4.3	313	727	0.8	1.95
Gender unidentified		3,184		3,095	97.2	49	40	2.8	9	3	0.4	1.99
Total	**1,103,797**	**256,545**	**23.2**	**246,223**	**96.0**	**3,450**	**6,872**	**4.0**	**584**	**1,341**	**0.8**	**1.93**

Source: Illinois Department of Public Health - Illinois Lead Program Surveillance Database, 2015. aPopulation data compiled from bridged-race Vintage 2015 (2010-2015) post-censal population estimates (released by NCHS June 28, 2016), accessed at ***http://wonder.cdc.gov/bridged-race-v2015.html*** on July 25, 2016. Data includes one venous blood lead test result per child; if there was no venous test then the highest capillary test result was used.

About 58 percent of children tested for lead exposure had at least one venous blood lead test with a geometric mean BLL of 1.93µg/dL (Table 7).

Table 7: Children Tested for Blood Lead by **Collection Method** - January 1 to December 31, 2015

Blood Specimen Type	Blood Lead Tests Reported to IDPH[1]		Children Tested								Range	Geomean
			Total		<5µg/dL		≥5µg/dL		≥10µg/dL			
	n	%	n	%	n	%	n	%	n	%		
Venous	152,739	56.2	148,026	57.7	141,154	95.4	6,872	4.5	1,341	0.9	1-190	1.94
Capillary[2]	119,256	43.8	108,519	42.3	105,069	96.8	3,450	2.9	584	0.5	1-82	1.92
Total	**271,995**		**256,545**		**246,223**	**96.0**	**10,322**	**4.0**	**1,925**	**0.8**	**1-190**	**1.93**

Source: Illinois Department of Public Health - Illinois Lead Program Surveillance Database, 2015. Data includes one venous blood lead test result per child; if there was no venous test, then the highest capillary test result. [1]Data includes multiple tests per child; Capillary also includes unknown blood specimen type.

*The Illinois Lead Program maintains a surveillance system of blood lead test results for **children 15 years of age and younger**. Illinois law requires reporting of **all** blood lead test results by physicians, laboratories, hospitals, clinics, and other healthcare facilities to the Illinois Lead Program. Blood lead test results for persons 16 years of age and older are entered into the Adult Blood Lead*

The Program currently receives approximately 80 percent of blood lead test results electronically. For paper-reported results, the Program contracted with an agency to perform the data entry. The ultimate goal is to eliminate all paper reporting (Table 8).

Table 8: Number of Blood Lead Tests by **Methods of Reporting** - January 1 to December 31, 2015

Blood Lead Tests Reported to IDPH in 2015	Blood Tests Reported in 2015 (%)
Paper reported (mail or fax)	20
Electronic reporting	80

Source: Illinois Department of Public Health - Illinois Lead Program Surveillance Database, 2015.

Blood Lead Tests Analyzed at IDPH Laboratory: A total of 271,995 blood lead samples collected from 256,545 children were analyzed by 274 laboratories as reported to IDPH. Approximately 16 percent of the blood lead tests were analyzed at IDPH laboratory accounting for 19 percent of children with lead levels ≥10µg/dL. For delegate agencies, there is a financial advantage for sending blood samples to be analyzed for lead at IDPH's Division of Laboratories because these grantees are compensated for each blood specimen submitted.

Portable Desk Top Blood Analyzer: LeadCare* is a portable, CLIA-waived, capillary blood lead testing device with a maximum reading of 65µg/dL that operates within ±3.3µg/dL error range. Approximately 20.7 percent (58,048) of all blood lead tests reported to IDPH in 2015 were from LeadCare users. In 2015, there were 352 LeadCare users in Illinois. Among the users, 302 reported at least one capillary blood lead test result and 34 percent (103 users) reported BLL results ≥10µg/dL. A follow-up confirmatory venous test is strongly recommended following an elevated capillary BLL.

Systematic Tracking of Elevated Lead Levels and Remediation (STELLAR) to Healthy Homes and Lead Poisoning Surveillance System (HHLPSS): IDPH is diligently working on adopting a CDC-sponsored, web-based data system to replace STELLAR.

Estimated Population and Children Tested for Blood Lead by County and Delegate Agencies: In 2015, BLLs in children ranged from 1.0µg/dL to 190µg/dL with a mean of 2.3µg/dL, median of 2.0 and mode or most frequent level of 3.0µg/dL. Table 8 reflects the number of children tested for the first time in 2015 as well as those retested for follow-up by county, lead level, and blood specimen collection type.

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Table 9: Children Tested for Blood Lead by County and Delegate Agencies in 2015

Illinois/ County/ Delegate Agency	Estimated Population 6 Years of Age and Younger[a]	All Children Tested by County, Blood Collection Type and BLL										Illinois/ County/ Delegate Agency	Children Tested for the First Time in 2015						
		All Children Tested in 2014					All Children Tested in 2015						Children Tested for the First Time in 2015	By Blood Draw Type and Level, µg/dL					
		Total Tested 2014		Capillary and Venous in µg/dL (%)[b]			Total Tested 2015		Capillary and Venous in µg/dL (%)[b]				Children Tested for the First Time in 2015	Venous (%)[c]			Capillary (%)		
		N	(%)[a]	<5	5-9	≥10	N	(%)[a]	<5	5-9	≥10			<5	5-9	≥10	<5	5-9	≥10
Illinois	**1,103,797**	**269,230**	**24**	**93.2**	**6.0**	**0.8**	**256,545**	**23.2**	**96.0**	**3.3**	**0.8**	**Illinois**	**124,365**	**48.1**	**1.5**	**0.4**	**48.5**	**1.2**	**0.3**
Adams	5,960	1,279	22	88.5	7.7	3.8	1,500	25.2	90.1	7.0	2.9	Adams	924	21.9	1.6	1.1	70.7	3.4	1.4
Alexander	648	133	18	95.5	2.2	2.3	126	19.4	90.5	5.6	4.0	Alexander	90	61.1	3.3	3.3	30.0	1.1	1.1
Bond	1,120	238	18	95.8	3.4	0.8	232	20.7	96.1	2.6	1.3	Bond	148	12.8	0.7	0.7	83.8	2.0	0.0
Boone	4,367	943	19	98.4	1.5	0.1	958	21.9	98.3	1.3	0.4	Boone	447	57.5	0.7	0.4	40.7	0.7	0.0
Brown	404	71	18	91.5	7.1	1.4	87	21.5	93.1	6.9	0.0	Brown	59	13.6	0.0	0.0	79.7	6.8	0.0
Bureau	2,605	503	18	94.4	3.8	1.8	504	19.3	94.6	3.0	2.4	Bureau	349	63.0	2.6	2.0	31.8	0.6	0.0
Calhoun	369	73	19	93.2	4.1	2.7	43	11.7	90.7	9.3	0.0	Calhoun	32	25.0	3.1	0.0	65.6	6.3	0.0
Carroll	956	244	25	92.6	5.8	1.6	201	21.0	97.5	2.5	0.0	Carroll	124	38.7	1.6	0.0	57.3	2.4	0.0
Cass	1,065	403	34	90.8	5.5	3.7	362	34.0	89.5	7.7	2.8	Cass	213	23.9	3.3	1.4	66.2	4.2	0.9
Champaign	15,925	2,639	16	97.7	2.1	0.2	2,296	14.4	98.2	1.4	0.4	Champaign	1,648	35.0	0.7	0.1	62.9	1.1	0.2
Christian	2,622	533	18	95.7	3.4	0.9	620	23.6	96.0	3.2	0.8	Christian	312	46.2	1.0	0.3	50.0	2.6	0.0
Clark	1,329	267	21	97.0	3.0	0.0	294	22.1	95.9	3.7	0.3	Clark	197	20.8	1.0	0.0	77.2	1.0	0.0
Clay	1,136	254	21	94.5	4.7	0.8	272	23.9	92.3	7.4	0.4	Clay	175	3.4	0.0	0.0	88.6	7.4	0.6
Clinton	2,884	362	12	98.1	1.3	0.6	365	12.7	97.8	1.6	0.5	Clinton	252	41.3	0.4	0.4	56.3	1.2	0.4
Coles	3,566	837	22	95.5	3.2	1.3	831	23.3	94.0	4.8	1.2	Coles	514	11.3	0.8	0.2	83.1	3.9	0.8
Cook w/o Chicago	211,323	47,504	22.5	83.5	16	0.4	40,003	18.9	94.4	5.3	0.3	Cook w/o Chicago	19,751	54.1	3.4	0.6	41.3	0.6	0.03
Chicago	253,669	100,941	39.7	94.9	4	0.8	94,559	37.3	96.6	2.6	0.8	Chicago	35,650	69.1	1.5	0.4	28.3	0.5	0.2
Crawford	1,471	270	19	95.2	2.9	1.9	225	15.3	92.0	7.6	0.4	Crawford	155	9.7	0.0	0.6	84.5	5.2	0.0
Cumberland	943	156	16	97.4	2.0	0.6	158	16.8	97.5	1.9	0.6	Cumberland	95	11.6	0.0	0.0	86.3	2.1	0.0
DeKalb	8,525	1,504	17	97.6	2.2	0.2	1,432	16.8	98.2	1.5	0.3	DeKalb	82	41.4	0.5	0.5	56.6	0.8	0.1
DeWitt	1,205	159	13	96.2	3.2	0.6	166	13.8	94.0	5.4	0.6	DeWitt	131	16.8	0.8	0.0	77.9	4.6	0.0
Douglas	1,900	322	17	95.7	1.8	2.5	235	12.4	96.2	2.6	1.3	Douglas	162	22.2	0.0	0.0	74.7	2.5	0.6
DuPage	78,007	8,889	11	97.8	1.8	0.4	8,626	11.1	98.6	1.2	0.3	DuPage	5,252	42.9	0.6	0.1	55.5	0.8	0.1
Edgar	1,285	285	20	94.0	5.3	0.7	260	20.2	95.4	4.2	0.4	Edgar	200	45.5	2.0	0.5	50.0	2.0	0.0
Edwards	514	108	21	96.3	3.7	0.0	103	20.0	97.1	2.9	0.0	Edwards	68	4.4	0.0	0.0	92.6	2.9	0.0
Effingham	3,102	467	15	93.6	4.3	2.1	459	14.8	95.2	4.4	0.4	Effingham	250	7.2	0.8	0.0	87.2	4.4	0.4
Fayette	1,673	317	18	95.6	3.8	0.6	344	20.6	96.8	2.0	1.2	Fayette	209	3.3	0.5	0.5	94.7	1.0	0.0
Ford	1,105	171	15	88.9	8.8	2.3	169	15.3	91.1	6.5	2.4	Ford	116	7.8	0.0	0.9	87.1	3.4	0.9
Franklin	3,357	503	15	95.8	3.0	1.2	512	15.3	98.4	1.0	0.6	Franklin	373	34.9	0.0	0.0	63.8	0.5	0.8
Fulton	2,447	366	14	89.9	7.9	2.2	395	16.1	90.6	8.1	1.3	Fulton	314	15.6	3.2	0.6	76.4	4.1	0.0
Gallatin	354	110	27	95.5	2.7	1.8	108	30.5	98.1	1.9	0.0	Gallatin	80	10.0	0.0	0.0	88.8	1.3	0.0
Greene	1,029	330	30	92.1	7.0	0.9	259	25.2	91.5	6.9	1.5	Greene	141	14.9	0.7	0.7	79.4	2.8	1.4
Grundy	4,529	477	10	97.1	2.7	0.2	648	14.3	96.6	2.6	0.8	Grundy	399	19.3	0.5	1.3	76.2	2.8	0.0
Hamilton	664	119	17	95.0	1.6	3.4	119	17.9	95.8	3.4	0.8	Hamilton	86	18.6	0.0	1.2	79.1	1.2	0.0

Illinois/ County/ Delegate Agency	Estimated Population 6 Years of Age and Younger[a]	All Children Tested by County, Blood Collection Type and BLL										Children Tested for the First Time in 2015							
		All Children Tested in 2014					All Children Tested in 2015						By Blood Draw Type and Level, µg/dL						
		Total Tested 2014		Capillary and Venous in µg/dL (%)[b]			Total Tested 2015		Capillary and Venous in µg/dL (%)[b]				Venous (%)[c]			Capillary (%)			
		N	(%)[a]	<5	5-9	≥10	N	(%)[a]	<5	5-9	≥10		<5	5-9	≥10	<5	5-9	≥10	
Illinois	**1,103,797**	**269,230**	**24**	**93.2**	**6.0**	**0.8**	**256,545**	**23.2**	**96.0**	**3.3**	**0.8**	**Illinois**	**124,365**	**48.1**	**1.5**	**0.4**	**48.5**	**1.2**	**0.3**
Hancock	1,380	336	22	93.5	5.9	0.6	295	21.4	91.2	6.1	2.7	Hancock	201	13.4	2.0	1.5	78.6	3.5	1.0
Hardin	280	64	20	93.8	4.7	1.6	40	14.3	92.5	7.5	0.0	Hardin	27	51.9	0.0	0.0	40.7	7.4	0.0
Henderson	479	80	19	93.8	3.8	2.5	67	14.0	92.5	7.5	0.0	Henderson	40	55.0	5.0	0.0	40.0	0.0	0.0
Henry	3,890	879	21	92.0	6.2	1.8	719	18.5	92.6	6.0	1.4	Henry	440	13.4	1.4	0.2	80.5	3.9	0.7
Iroquois	2,191	394	17	93.7	5.0	1.3	392	17.9	93.6	5.9	0.5	Iroquois	274	26.3	1.5	0.4	67.5	4.4	0.0
Jackson	4,210	995	23	97.8	2.0	0.2	997	23.7	98.8	1.0	0.2	Jackson	609	40.7	0.5	0.0	58.5	0.2	0.2
Jasper	836	107	14	97.2	2.8	0.0	97	11.6	97.9	2.1	0.0	Jasper	60	6.7	0.0	0.0	90.0	3.3	0.0
Jefferson	3,344	613	18	95.9	3.3	0.8	516	15.4	96.1	2.7	1.2	Jefferson	362	20.7	0.0	0.3	77.3	1.4	0.3
Jersey	1,648	432	26	97.0	2.3	0.7	417	25.3	95.7	3.8	0.5	Jersey	215	13.5	0.9	0.0	82.8	1.9	0.9
Jo Daviess	1,460	126	8	77.8	22.2	0.0	239	16.4	94.6	4.2	1.3	Jo Daviess	183	38.3	1.1	0.5	55.2	4.4	0.5
Johnson	813	129	15	94.6	3.1	2.3	111	13.7	93.7	3.6	2.7	Johnson	77	26.0	0.0	1.3	68.8	2.6	1.3
Kane	49,807	14,151	26	95.9	3.2	0.9	13,015	26.1	97.0	2.4	0.7	Kane	5,392	26.7	1.1	0.4	70.4	1.1	0.2
Kankakee	9,429	2,581	25	96.4	2.9	0.7	2,405	25.5	96.2	3.0	0.7	Kankakee	1,209	13.0	0.3	0.2	83.2	2.9	0.3
Kendall	12,948	920	7	99.1	0.9	0.0	721	5.6	98.2	1.7	0.1	Kendall	482	70.5	0.6	0.2	27.8	0.8	0.0
Knox	3,642	863	23	85.7	9.4	4.9	927	25.5	87.1	10.0	2.9	Knox	607	47.4	4.6	1.8	41.0	4.3	0.8
Lake	59,737	9,180	14	98.5	1.2	0.3	8,384	14.0	98.7	1.1	0.2	Lake	4,809	48.1	0.5	0.1	50.60.6	0.1	
LaSalle	8,456	1,450	16	94.1	4.0	1.9	1,486	17.6	93.5	4.6	1.9	LaSalle	978	46.1	2.8	1.0	48.7	1.2	0.2
Lawrence	1,216	269	22	95.2	4.1	0.7	273	22.5	95.6	2.9	1.5	Lawrence	182	7.1	0.5	0.5	91.2	0.0	0.5
Lee	2,482	195	7	94.9	3.6	1.5	155	6.2	95.5	3.9	0.6	Lee	102	78.4	2.0	1.0	17.6	1.0	0.0
Livingston	2,780	569	18	93.3	5.1	1.6	511	18.4	95.9	3.9	0.2	Livingston	298	4.4	0.0	0.0	92.6	3.0	0.0
Logan	2,034	395	18	96.7	2.3	1.0	364	17.9	94.2	3.6	2.2	Logan	266	15.8	0.4	1.9	78.9	2.6	0.4
McDonough	2,066	399	19	92.7	5.5	1.8	374	18.1	89.8	7.0	3.2	McDonough	262	41.2	1.9	1.1	52.3	2.7	0.8
McHenry	24,299	2,145	8	96.5	3.2	0.3	1,919	7.9	97.9	1.9	0.2	McHenry	1,177	24.6	0.7	0.2	73.2	1.4	0.0
McLean	14,521	3,155	21	96.3	2.9	0.8	3,054	21.0	96.6	2.6	0.8	McLean	1,948	1.8	0.7	0.4	94.9	1.7	0.5
Macon	9,235	2,430	25	93.7	5.1	1.2	1,828	19.8	93.3	4.8	1.9	Macon	924	26.4	0.3	0.2	68.1	3.6	1.4
Macoupin	3,290	710	19	91.7	5.9	2.4	640	19.5	95.5	3.1	1.4	Macoupin	404	25.5	0.2	0.7	69.8	3.2	0.5
Madison	22,060	4,296	19	96.7	2.5	0.8	4,243	19.2	97.3	2.1	0.7	Madison	2,359	42.8	0.8	0.3	54.9	0.9	0.3
Marion	3,365	773	22	94.7	3.4	1.9	747	22.2	96.0	3.1	0.9	Marion	450	9.6	0.2	0.4	87.6	2.2	0.0
Marshall	883	214	22	89.3	9.3	1.4	191	21.6	94.2	4.7	1.0	Marshall	126	8.7	0.8	0.0	87.3	3.2	0.0
Mason	996	307	31	91.5	7.5	1.0	292	29.3	88.0	7.2	4.8	Mason	128	6.3	0.8	5.5	78.9	7.0	1.6
Massac	1,215	196	15	93.9	5.1	1.0	154	12.7	95.5	3.9	0.6	Massac	109	59.6	0.9	0.0	37.6	1.8	0.0
Menard	963	113	11	96.5	3.5	0.0	98	10.2	99.0	1.0	0.0	Menard	67	31.3	0.0	0.0	67.2	1.5	0.0
Mercer	1,158	313	24	92.0	7.7	0.3	267	23.1	92.5	5.6	1.9	Mercer	151	19.2	2.0	1.3	72.2	4.6	0.7
Monroe	2,534	358	13	93.6	6.1	0.3	331	13.1	96.1	3.3	0.6	Monroe	246	29.3	0.4	0.0	65.9	3.7	0.8

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Illinois/ County/ Delegate Agency	Estimated Population 6 Years of Age and Younger[a]	All Children Tested by County, Blood Collection Type and BLL									
		All Children Tested in 2014					All Children Tested in 2015				
		Total Tested 2014		Capillary and Venous in µg/dL (%)[b]			Total Tested 2015		Capillary and Venous in µg/dL (%)[b]		
		N	(%)[a]	<5	5-9	≥10	N	(%)[a]	<5	5-9	≥10
Illinois	**1,103,797**	**269,230**	**24**	**93.2**	**6.0**	**0.8**	**256,545**	**23.2**	**96.0**	**3.3**	**0.8**
Montgomery	2,181	470	21	94.3	4.4	1.3	474	21.7	95.6	4.0	0.4
Morgan	2,570	768	29	91.1	6.7	2.2	759	29.5	92.5	6.6	0.9
Moultrie	1,346	213	16	94.4	5.6	0.0	198	14.7	94.9	4.0	1.0
Ogle	3,818	408	10	95.8	3.0	1.2	372	9.7	96.8	2.4	0.8
Peoria	18,122	3,886	22	89.7	7.8	2.5	2,852	15.7	90.8	6.8	2.4
Perry	1,506	331	21	97.6	2.1	0.3	332	22.0	94.9	4.8	0.3
Piatt	1,255	181	15	96.7	2.2	1.1	162	12.9	97.5	0.6	1.9
Pike	1,224	281	20	94.3	5.3	0.4	269	22.0	91.1	7.8	1.1
Pope	180	34	13	94.1	5.9	0.0	29	16.1	93.1	6.9	0.0
Pulaski	417	57	12	86.0	5.2	8.8	81	19.4	95.1	2.5	2.5
Putnam	347	60	15	98.3	1.7	0.0	46	13.3	100.0	0.0	0.0
Randolph	2,320	370	16	94.1	3.7	2.2	400	17.2	96.3	2.8	1.0
Richland	1,360	196	14	92.3	5.1	2.6	214	15.7	89.3	8.4	2.3
Rock Island	12,901	4,488	34	89.2	8.9	1.9	3,367	26.1	91.5	6.6	1.9
St. Clair w/o ESHD	17,044	2,863	11	96.9	2.5	0.6	2,672	15.7	97.1	2.4	0.5
Saline	2,014	620	30	94.2	3.4	2.4	475	23.6	98.1	1.5	0.4
Sangamon	16,703	3,087	18	93.4	5.1	1.5	3,032	18.2	93.9	4.5	1.6
Schuyler	437	82	15	90.2	7.4	2.4	104	23.8	93.3	4.8	1.9
Scott	328	91	22	92.3	7.7	0.0	92	28.0	88.0	8.7	3.3
Shelby	1,660	298	17	97.7	1.6	0.7	258	15.5	95.7	2.3	1.9
Stark	416	130	31	86.2	10.7	3.1	127	30.5	84.3	12.6	3.1
Stephenson	3,587	1,162	30	85.5	10.9	3.6	1,203	33.5	85.7	10.2	4.1
Tazewell	11,421	2,131	18	96.0	3.0	1.0	1,716	15.0	96.9	1.9	1.2
Union	1,316	219	16	94.1	4.5	1.4	241	18.3	97.1	2.1	0.8
Vermilion	7,467	1,590	21	95.7	3.1	1.2	1,537	20.6	96.9	2.5	0.6
Wabash	905	201	21	90.5	7.0	2.5	192	21.2	93.2	6.8	0.0
Warren	1,566	368	25	89.4	7.9	2.7	313	20.0	88.8	10.5	0.6
Washington	1,046	140	13	97.1	1.5	1.4	151	14.4	94.7	3.3	2.0
Wayne	1,360	254	18	90.9	7.9	1.2	267	19.6	88.4	11.2	0.4
White	1,272	255	20	91.8	6.6	1.6	245	19.3	94.7	4.5	0.8
Whiteside	4,661	1,168	24	96.2	2.8	1.0	1,097	23.5	95.6	3.3	1.1
Will	58,874	10,543	16	97.2	2.4	0.4	9,851	16.7	97.5	2.1	0.4
Williamson	5,440	873	16	95.8	3.1	1.1	868	16.0	97.6	2.0	0.5
Winnebago	24,920	5,874	22	94.3	4.2	1.5	5,452	21.9	94.9	3.9	1.2

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Illinois/ County/ Delegate Agency	Children Tested for the First Time in 2015						
	Children Tested for the First Time in 2015	By Blood Draw Type and Level, µg/dL					
		Venous (%)[c]			Capillary (%)		
		<5	5-9	≥10	<5	5-9	≥10
Illinois	**124,365**	**48.1**	**1.5**	**0.4**	**48.5**	**1.2**	**0.3**
Montgomery	294	17.7	1.0	0.0	79.9	1.4	0.0
Morgan	391	28.9	1.8	0.5	62.4	5.9	0.5
Moultrie	118	17.8	0.0	0.0	79.7	2.5	0.0
Ogle	248	56.9	0.8	0.8	41.1	0.4	0.0
Peoria	1,775	4.6	0.8	0.7	88.7	4.2	1.0
Perry	195	33.8	1.0	0.0	60.5	4.6	0.0
Piatt	129	72.9	0.0	0.8	25.6	0.8	0.0
Pike	176	14.2	0.6	0.0	79.5	5.7	0.0
Pope	20	20.0	0.0	0.0	70.0	10.0	0.0
Pulaski	58	56.9	0.0	1.7	41.4	0.0	0.0
Putnam	40	67.5	0.0	0.0	32.5	0.0	0.0
Randolph	262	15.6	0.4	0.4	81.7	1.5	0.4
Richland	153	2.0	0.0	0.7	88.9	7.2	1.3
Rock Island	1,740	22.5	0.8	0.7	70.2	4.9	0.7
St. Clair w/o ESHD	1,461	20.2	0.8	0.1	76.9	1.8	0.1
Saline	289	8.7	0.3	0.0	90.3	0.3	0.3
Sangamon	1,717	26.1	0.6	0.3	68.8	3.2	1.0
Schuyler	77	23.4	1.3	0.0	70.1	3.9	1.3
Scott	60	21.7	1.7	1.7	68.3	6.7	0.0
Shelby	163	19.0	0.0	0.6	77.9	0.6	1.8
Stark	84	8.3	2.4	1.2	79.8	7.1	1.2
Stephenson	588	51.0	4.6	2.7	34.9	4.6	2.2
Tazewell	1,141	1.3	0.2	0.5	96.1	1.4	0.4
Union	164	62.2	1.2	0.0	34.8	0.6	1.2
Vermilion	950	74.1	1.6	0.1	23.5	0.3	0.4
Wabash	135	4.4	0.7	0.0	91.1	3.7	0.0
Warren	186	46.2	5.4	0.5	45.2	2.7	0.0
Washington	113	32.7	0.9	1.8	59.3	4.4	0.9
Wayne	182	9.3	0.5	0.5	82.4	7.1	0.0
White	166	18.7	0.6	1.2	76.5	3.0	0.0
Whiteside	632	27.4	0.6	0.3	69.6	1.6	0.5
Will	4,954	26.3	0.3	0.1	71.6	1.6	0.2
Williamson	621	35.3	0.0	0.2	63.0	1.4	0.2
Winnebago	2,883	56.1	1.2	0.4	40.3	1.6	0.5

Illinois/ County/ Delegate Agency	Estimated Population 6 Years of Age and Younger[a]	All Children Tested by County, Blood Collection Type and BLL									
		All Children Tested in 2014					All Children Tested in 2015				
		Total Tested 2014		Capillary and Venous in µg/dL (%)[b]			Total Tested 2015		Capillary and Venous in µg/dL (%)[b]		
		N	(%)[a]	<5	5-9	≥10	N	(%)[a]	<5	5-9	≥10
Illinois	**1,103,797**	**269,230**	**24**	**93.2**	**6.0**	**0.8**	**256,545**	**23.2**	**96.0**	**3.3**	**0.8**
Woodford	3,497	547	15	96.3	2.1	1.6	519	14.8	97.7	2.3	0.0
Egyptian[1]	3,661	985	26	93.7	4.2	2.1	828	22.6	97.1	2.7	0.2
ESHD[2]	6,611	3,487	167	92.5	6.0	1.5	3,077	46.5	93.9	4.9	1.1
Evanston	6,043	1,556	26	95.3	4.0	0.7	1,568	25.9	97.8	1.7	0.5
Oak Park	4,837	1,043	22	95.0	3.8	1.2	1,084	22.4	96.9	2.3	0.8
Skokie	4,980	903	18	93.7	6.7	0.1	902	18.1	98.3	1.6	0.1
Southern Seven[3]	4,996	832	16	93.8	4.3	2.0	782	15.7	94.6	3.7	1.7
Stickney	583	130	22	92.3	0	0	109	18.7	99.1	0	0.9

Source: Illinois Department of Public Health – Illinois Lead Program Surveillance Database 2014 and 2015. [a]Population data compiled from bridged-race Vintage 2015 (2010-2015) post-censal population estimates (released by NCHS June 28, 2016) accessed at ***http://wonder.cdc.gov/bridged-race-v2015.html*** on August 25, 2016. [b]Capillary or venous blood draw. [c]Confirmed test in Illinois is a venous blood draw. Actual numbers are available at IDPH. Due to rounding, decimals may not add up perfectly

[1] Egyptian Counties: Galatin, Saline, and White

[2] ESHD or East Side Health District includes the cities of Alorton, Brooklyn, Cahokia, Centreville, East St. Louis, Lovejoy, National Stock Yards, Sauget, Washington Park and Fairmont City.

[3] Southern Seven Counties: Alexander, Hardin, Johnson, Massac, Pope, Pulaski and Union

In 2015, most laboratories that analyzed blood lead were able to quantify and accurately report levels below 5µg/dL compared to previous years.

FDA Warning: Consumers should not purchase or consume recalled **Life Rising brand dietary supplement product DHZC-2 tablets from Ton Shen Health** because they have been found to contain high levels of lead.
http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm518288.htm

Illinois Lead Program 2015 Annual Surveillance Report

Illinois/ County/ Delegate Agency	Children Tested for the First Time in 2015						
	Children Tested for the First Time in 2015	By Blood Draw Type and Level, µg/dL					
		Venous (%)[c]			Capillary (%)		
		<5	5-9	≥10	<5	5-9	≥10
Illinois	**124,365**	**48.1**	**1.5**	**0.4**	**48.5**	**1.2**	**0.3**
Woodford	328	3.0	0.6	0.0	95.4	0.9	0.0
Egyptian[1]	535	12.0	0.4	0.4	85.8	1.3	0.2
ESHD[2]	1,128	21.9	0.6	0.3	73.4	3.2	0.6
Evanston	946	55.5	1.3	0.5	42.5	0.4	0.0
Oak Park	642	26.2	1.2	0.3	84.9	1.2	0.3
Skokie	515	65.2	0.6	0.0	33.6	0.6	0.0
Southern Seven[3]	545	53.8	1.1	0.9	41.7	1.8	0.7
Stickney	42	81	0	0	19.0	0	0

Lead Testing Activities in Illinois, Chicago and the United States: 2014-2015

CDC only reported blood lead data for children 5 years of age and younger. In order to compare Illinois data to the national data published by CDC, Table 10 only included children five years of age and younger (<72 months) whose BLL results were reported to IDPH in 2014 and 2015.

Table 10: Blood Lead Burden for Children Five Years of Age and Younger in Illinois, Chicago, and the United-States: 2014-2015

	2014		2015	
	N	%	N	%
Illinois Children Tested	252,732	26.6	248,223	26.3
BLL≥10µg/dL Illinois intervention level	2,162	0.9	1,871	0.8
BLL≥5µg/dL Federal Reference Value	17,063	6.8	10,040	4.0
Illinois without Chicago	160,404		161,420	
BLL≥10µg/dL	1,438	0.9	1,211	0.8
BLL≥5µg/dL	13,357	8.3	7,033	4.4
Chicago	92,328		86,803	
BLL≥10µg/dL	724	0.8	660	0.8
BLL ≥5µg/dL	3,706	4.1	3,007	3.5
United States[1]	2,496,140	10.3	2,415,604	10.0
BLL ≥10µg/dL	13,265	0.5	11,681	0.5
BLL ≥5µg/dL	100,775	4.2	79,957	3.3

Source: Illinois Lead Program Surveillance Data, 2014-2015 and U.S. Centers for Disease Control and Prevention (CDC) Blood Lead Surveillance available at the time at: ***http://www.cdc.gov/nceh/lead/data/national.htm*** (downloaded August 29, 2016)

Due to strict data reporting requirements, Illinois data with missing core address fields are often under-reported nationally, which may contribute to a denominator differential of Illinois data as reported by CDC.

Children's products: *No person, firm, or corporation shall sell, have, offer for sale, or transfer the items… that is more than 0.004% (40 parts per million) but less than 0.06% (600 parts per million) by total weight or a lower standard for lead content as may be established by federal or State law or rule unless that item bears a warning statement …shall contain at least the following: "WARNING: CONTAINS LEAD. MAY BE HARMFUL IF EATEN OR CHEWED. COMPLIES WITH FEDERAL STANDARDS"* ***(410 ILCS 45/6) (from Ch. 111 1/2, par. 1306) Sec. 6.b)***

Lead Levels of Children Who Benefited from Medical Assistance Programs

Medical assistance programs refer to the authorized Social Security Acts of Title XIX that include Medicaid, All Kids, and Moms & Babies, which are administered by HFS.
https://www.illinois.gov/hfs/MedicalPrograms/AllKids/Pages/default.aspx

The only way to know whether a child has been exposed to lead is via blood lead testing. State and Federal mandates require that all children enrolled in HFS' medical programs be considered at-risk for lead poisoning and receive a blood lead test prior to 12 and 24 months of age. If a child is 3-6 years of age and has not been tested, a blood lead test is required. All children enrolled in HFS Medical Programs are expected to be tested regardless of where they live.

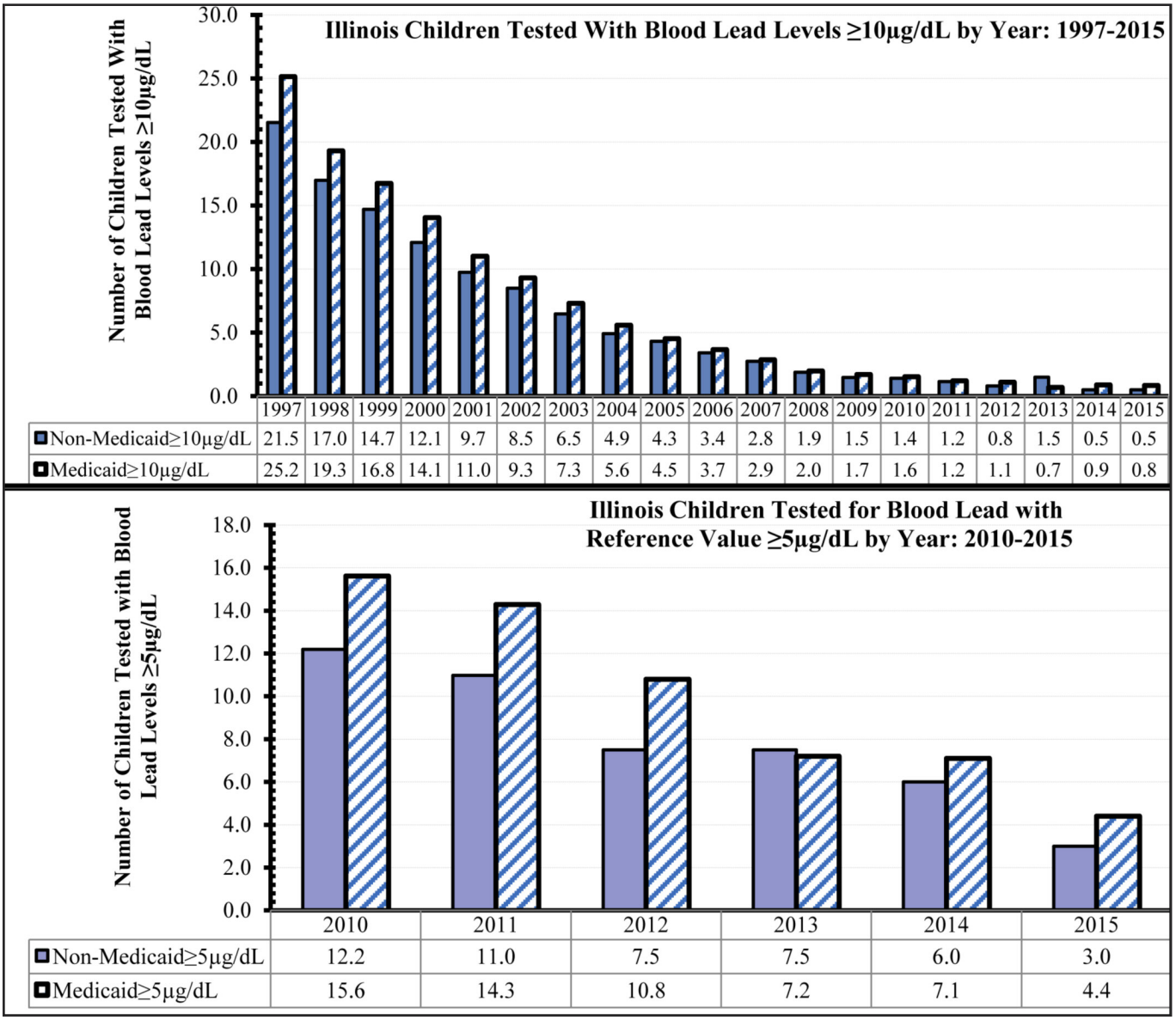
Bonus Payment for High Performance: Annual bonus payments were provided by HFS to Illinois Health Connect Primary Care Providers who met the benchmark for blood lead testing of qualifying patients. The bonus payment was based on the number of children who had at least one capillary or venous blood lead test performed by the age of 24 months (as of December 1, 2015).

For specific questions about the lead test performance bonus measure go to the IHC website or call the IHC Provider Services Help Desk at 1-877-912-1999.

Medicaid and Non-Medicaid Enrolled Children: Of all children tested in 2015, 73 percent were Medical Assistance Program recipients. Of the 73 percent, 4.4 percent had lead levels at the reference value, while 3.0 percent of non-recipients had lead levels at the reference value. Figure 8 highlights a significant decrease in childhood lead poisoning among Illinois children.

The Provider Handbook may be accessed at: ***https://www.illinois.gov/hfs/SiteCollectionDocuments/hk200.pdf***

Figure 9: Elevated Blood Lead Level of Medicaid and Non-Medicaid Enrolled Children: 1997-2015



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Non-Medicaid≥10µg/dL	21.5	17.0	14.7	12.1	9.7	8.5	6.5	4.9	4.3	3.4	2.8	1.9	1.5	1.4	1.2	0.8	1.5	0.5	0.5
Medicaid≥10µg/dL	25.2	19.3	16.8	14.1	11.0	9.3	7.3	5.6	4.5	3.7	2.9	2.0	1.7	1.6	1.2	1.1	0.7	0.9	0.8

	2010	2011	2012	2013	2014	2015
Non-Medicaid≥5µg/dL	12.2	11.0	7.5	7.5	6.0	3.0
Medicaid≥5µg/dL	15.6	14.3	10.8	7.2	7.1	4.4

Source: Illinois Department of Public Health-Illinois Lead Program Surveillance Database: 1996-2015 and the Illinois Department of Healthcare and Family Services Enterprise Data Warehouse

Table 11 reflects the percentage of children enrolled in Medical Assistance Programs who were tested for BLL in 2015.

Table 11: Percentage of Children Tested for Blood Lead in 2015 Enrolled for Medical Assistance

County	Total Number of Children Tested in 2015	Medicaid Enrolled Children (%)			Non-Medicaid Enrolled Children (%)		
		Children Tested Who Were Medicaid-Enrolled (%)	Percentage of Medicaid-Enrolled Children Tested At		Children Tested Who Were Non-Medicaid-Enrolled (%)	Percentage of Non Medicaid-Enrolled Children Tested At	
			≥ 10 µg/dL	≥ 5 µg/dL		≥ 10 µg/dL	≥ 5 µg/dL
Illinois	**256,545**	**73.0**	**0.8**	**4.4**	**27.0**	**0.5**	**3.0**
Adams	1,500	76.2	3.7	11.9	23.8	0.6	3.6
Alexander	126	87.3	3.6	10.0	12.7	6.3	6.3
Bond	232	80.2	1.6	4.8	19.8	0.0	0.0
Boone	958	83.6	0.4	1.5	16.4	0.6	2.5
Brown	87	69.0	0.0	10.0	31.0	0.0	0.0
Bureau	504	73.2	2.7	6.5	26.8	1.5	2.2
Calhoun	43	48.8	0.0	9.5	51.2	0.0	9.1
Carroll	201	65.2	0.0	3.8	34.8	0.0	0.0
Cass	362	72.7	3.0	9.9	27.3	2.0	12.1
Champaign	2,296	69.5	0.3	1.8	30.5	0.7	2.0
Christian	620	79.8	1.0	4.4	20.2	0.0	2.4
Clark	294	70.7	0.0	4.8	29.3	1.2	2.3
Clay	272	84.6	0.4	9.1	15.4	0.0	0.0
Clinton	365	70.1	0.0	1.6	29.9	1.8	3.7
Coles	831	71.5	1.3	7.1	28.5	0.8	3.4
Cook	134,562	76.8	0.7	4.3	23.2	0.5	3.3
Crawford	225	81.8	0.5	9.8	18.2	0.0	0.0
Cumberland	158	74.7	0.8	3.4	25.3	0.0	0.0
De Kalb	1,432	78.2	0.3	1.7	21.8	0.6	2.2
De Witt	166	58.4	1.0	8.2	41.6	0.0	2.9
Douglas	235	71.1	1.8	5.4	28.9	0.0	0.0
Du Page	8,626	67.0	0.3	1.3	33.0	0.2	1.7
Edgar	260	68.5	0.6	5.1	31.5	0.0	3.7
Edwards	103	71.8	0.0	4.1	28.2	0.0	0.0
Effingham	459	85.0	0.5	5.6	15.0	0.0	0.0
Fayette	344	88.7	1.3	3.3	11.3	0.0	2.6
Ford	169	81.1	2.9	10.9	18.9	0.0	0.0
Franklin	512	77.5	0.8	1.8	22.5	0.0	0.9
Fulton	395	70.1	1.4	10.8	29.9	0.8	5.9
Gallatin	108	49.1	0.0	1.9	50.9	0.0	1.8
Greene	259	74.1	2.1	11.5	25.9	0.0	0.0
Grundy	648	59.3	0.8	3.4	40.7	0.8	3.4
Hamilton	119	73.9	1.1	5.7	26.1	0.0	0.0
Hancock	295	67.1	3.0	9.1	32.9	2.1	8.2

County	Total Number of Children Tested in 2015	Medicaid Enrolled Children (%)			Non-Medicaid Enrolled Children (%)		
		Children Tested Who Were Medicaid-Enrolled (%)	Percentage of Medicaid-Enrolled Children Tested At		Children Tested Who Were Non-Medicaid-Enrolled (%)	Percentage of Non Medicaid-Enrolled Children Tested At	
			≥ 10 µg/dL	≥ 5 µg/dL		≥ 10 µg/dL	≥ 5 µg/dL
Illinois	**256,545**	**73.0**	**0.8**	**4.4**	**27.0**	**0.5**	**3.0**
Hardin	40	92.5	0.0	8.1	7.5	0.0	0.0
Henderson	67	79.1	0.0	7.5	20.9	0.0	7.1
Henry	719	70.1	2.0	8.5	29.9	0.0	4.7
Iroquois	392	71.2	0.7	7.5	28.8	0.0	3.5
Jackson	997	85.6	0.1	1.3	14.4	0.7	0.7
Jasper	97	83.5	0.0	2.5	16.5	0.0	0.0
Jefferson	516	75.0	1.0	4.1	25.0	1.6	3.1
Jersey	417	66.9	0.4	6.1	33.1	0.7	0.7
Jo Daviess	239	82.0	1.5	6.1	18.0	0.0	2.3
Johnson	111	73.9	3.7	7.3	26.1	0.0	3.4
Kane	13,015	83.1	0.7	3.0	16.9	0.6	2.9
Kankakee	2,405	74.7	0.8	3.8	25.3	0.7	3.8
Kendall	721	68.0	0.0	1.6	32.0	0.4	2.2
Knox	927	73.9	3.5	15.2	26.1	1.2	6.6
Lake	8,384	67.6	0.2	1.1	32.4	0.3	1.7
La Salle	1,486	72.9	2.0	7.2	27.1	1.5	4.7
Lawrence	273	72.2	1.0	5.1	27.8	2.6	2.6
Lee	155	70.3	0.9	6.4	29.7	0.0	0.0
Livingston	511	74.0	0.3	3.7	26.0	0.0	5.3
Logan	364	75.5	2.5	6.2	24.5	1.1	4.5
McDonough	374	72.5	3.0	11.1	27.5	3.9	7.8
McHenry	1,919	65.4	0.2	2.2	34.6	0.2	2.0
McLean	3,054	60.7	0.7	3.2	39.3	0.9	3.8
Macon	1,828	77.8	1.8	7.4	22.2	2.0	4.2
Macoupin	640	75.6	1.9	6.0	24.4	0.0	0.0
Madison	4,243	76.8	0.7	3.1	23.2	0.5	1.5
Marion	747	81.4	1.0	4.3	18.6	0.7	2.9
Marshall	191	65.4	1.6	8.0	34.6	0.0	1.5
Mason	292	86.0	4.8	12.0	14.0	4.9	12.2
Massac	154	77.3	0.8	5.0	22.7	0.0	2.9
Menard	98	64.3	0.0	0.0	35.7	0.0	2.9
Mercer	267	72.7	1.5	6.2	27.3	2.7	11.0
Monroe	331	41.7	0.0	2.2	58.3	1.0	5.2
Montgomery	474	75.3	0.6	5.0	24.7	0.0	2.6
Morgan	759	79.7	1.2	7.9	20.3	0.0	5.8
Moultrie	198	73.7	1.4	5.5	26.3	0.0	3.8

County	Total Number of Children Tested in 2015	Medicaid Enrolled Children (%)			Non-Medicaid Enrolled Children (%)		
		Children Tested Who Were Medicaid-Enrolled (%)	Percentage of Medicaid-Enrolled Children Tested At		Children Tested Who Were Non-Medicaid-Enrolled (%)	Percentage of Non Medicaid-Enrolled Children Tested At	
			≥ 10 µg/dL	≥ 5 µg/dL		≥ 10 µg/dL	≥ 5 µg/dL
Illinois	**256,545**	**73.0**	**0.8**	**4.4**	**27.0**	**0.5**	**3.0**
Ogle	372	69.6	0.8	3.5	30.4	0.9	2.7
Peoria	2,852	68.5	3.1	11.9	31.5	0.8	3.2
Perry	332	81.9	0.4	5.1	18.1	0.0	5.0
Piatt	162	50.6	3.7	3.7	49.4	0.0	1.3
Pike	269	73.2	1.5	11.2	26.8	0.0	2.8
Pope	29	86.2	0.0	8.0	13.8	0.0	0.0
Pulaski	81	82.7	1.5	4.5	17.3	7.1	7.1
Putnam	46	58.7	0.0	0.0	41.3	0.0	0.0
Randolph	400	72.0	1.4	3.8	28.0	0.0	3.6
Richland	214	86.0	2.7	12.5	14.0	0.0	0.0
Rock Island	3,367	78.2	2.2	9.0	21.8	0.8	6.7
St. Clair	5,749	82.8	0.8	4.7	17.2	0.9	4.1
Saline	475	80.0	0.5	2.4	20.0	0.0	0.0
Sangamon	3,032	80.5	1.6	6.4	19.5	1.9	4.7
Schuyler	104	61.5	1.6	6.3	38.5	2.5	7.5
Scott	92	80.4	4.1	14.9	19.6	0.0	0.0
Shelby	258	71.3	1.6	4.9	28.7	2.7	2.7
Stark	127	70.9	4.4	20.0	29.1	0.0	5.4
Stephenson	1,203	79.8	4.3	15.6	20.2	3.3	9.1
Tazewell	1,716	60.9	1.8	4.4	39.1	0.3	1.0
Union	241	69.7	0.6	2.4	30.3	1.4	4.1
Vermilion	1,537	80.6	0.6	3.4	19.4	0.7	2.0
Wabash	192	74.5	0.0	7.7	25.5	0.0	4.1
Warren	313	73.8	0.4	9.5	26.2	1.2	15.9
Washington	151	59.6	2.2	6.7	40.4	1.6	3.3
Wayne	267	78.7	0.5	12.4	21.3	0.0	8.8
White	245	75.5	1.1	6.5	24.5	0.0	1.7
Whiteside	1,097	78.1	1.2	5.0	21.9	0.8	2.1
Will	9,851	72.4	0.5	2.5	27.6	0.3	2.5
Williamson	868	79.5	0.6	2.6	20.5	0.0	1.7
Winnebago	5,452	85.7	1.3	5.3	14.3	0.8	3.6
Woodford	519	46.2	0.0	4.2	53.8	0.0	0.7

Source: Illinois Department of Public Health – Illinois Lead Program Surveillance Database and Illinois Department of Healthcare and Family Services Enterprise Data Warehouse, 2015 through an interagency data agreement. The SAS (statistical analysis software) and SQL (Structured Query Language) codes were used to query databases.

Based on all children tested in 2015, those with BLLs ≥10µg/dL were 0.6 percent for Medicaid-enrolled and 0.1 percent for non-Medicaid. Approximately 3.2 percent of all children tested were Medicaid-enrolled with lead levels at the reference value of ≥5µg/dL, compared to only 0.8 percent of children who did not participate in any medical assistance program. The overall geometric mean BLL in 2015 was about 1.9µg/dL irrespective of Medicaid-enrolled status (Table 12).

Table 12: Percentages and Geometric Mean Blood Lead Levels of Medicaid and Non-Medicaid Children Tested in 2015

Characteristic	All Children Tested	Percentage of Children Tested by BLL, Sample Type and Medicaid Status						Geometric Mean Blood Lead Level
		≥10 µg/dL			≥5 µg/dL			
	(n)%	Venous %	Capillary %	Total N	Venous %	Capillary %	Total %	
All Children Tested	**256,545**	**0.5**	**0.2**	**0.8**	**2.7**	**1.3**	**4.0**	**1.9**
Medicaid	73.0	0.4	0.2	0.6	2.2	1.0	3.2	**1.9**
Non-Medicaid	27.0	0.1	0.1	0.1	0.5	0.3	0.8	**2.1**

Source: Illinois Department of Public Health - Illinois Lead Program Surveillance Data 2015; [1]All denominators based on the total 256,545 children tested in 2015. Due to rounding, decimals may not add up exactly.

Blood Lead Levels in Refugee Children

IDPH's Minority Health Program manages the Refugee Health Assessment Program. This program monitors the testing of refugee children for blood lead poisoning following the CDC guidelines as part of the initial domestic refugee health assessment.

In 2015, there were 453 refugee children 6 years of age and younger at the time of testing who completed the initial health assessment in Illinois. Of those assessed, 356 children (79 percent) had blood lead results recorded at IDPH Refugee Health Assessment Database (Table 13).

Table 13: BLLs in Refugee Children 6 Years of Age and Younger in 2015

Number and Percentage of Refugee Children	N	%
Total number of children who completed the initial health assessment	453	
Children who completed the initial health assessment including a blood lead test	356	79
BLL ≥5 µg/dL*	46	13
BLL ≥6 µg/dL	25	7
BLL ≥25 µg/dL	< 5	0.8

Source: Illinois Department of Public Health – Center for Minority Health, 2015

*There were actually 85 children with BLL ≥5 µg/dL (23.9 percent). However, one laboratory with the lowest lead detection level of 5µg/dL reported 39 children with BLL <5µg/dL.

Recommendations for Refugee Children Post-Arrival Lead Testing

1. Check BLL of all refugee children 6 months–16 years of age upon their arrival in the United States (generally within 90 days, preferably within 30 days of arrival).
2. Within 3–6 months post-resettlement, a follow-up blood lead test should be conducted on all refugee children aged 6 months–6 years of age, regardless of the initial testing BLL result.
3. Within 90 days of their arrival in the United States, children aged 6 months through 6 years of age should also undergo nutritional assessment and testing for hemoglobin or hematocrit level with one or more of the following: mean corpuscular volume (MCV) with the red cell distribution width (RDW), ferritin, transferrin saturation, or reticulocyte hemoglobin content. A routine complete blood count with differential is recommended for all refugees following their arrival in the United States, and these red cell parameters are included in this testing.
4. Provide daily pediatric multivitamins with iron to all refugee children aged 6 months through 6 years of age.

Source: Adapted from ***http://www.cdc.gov/immigrantrefugeehealth/guidelines/lead-guidelines.html***

For more information on the Refugee Health Assessment Program, go to ***http://www.dph.illinois.gov/topics-services/life-stages-populations/minority-health***

Adult Blood Lead Registry

The Program and the Adult Blood Lead Registry (ABLR) comprise the Illinois blood lead surveillance systems (Figure 10).

Figure 10: Illinois Blood Lead Surveillance Programs

Approximately 99 percent of lead absorbed by an adult can be excreted within a few weeks compared to only a 33 percent excretion by children. Lead exposure in adults may result in short- or long-term cognitive dysfunction, adverse reproductive outcomes, and cardiovascular or kidney damage. Adults may also suffer from complications during pregnancy, high blood pressure, or neurological disorders.

The ABLR, maintained by Division of Epidemiologic Studies, collects blood lead data for adults 16 years of age and older and notifies federal enforcement agencies to trigger inspections and/or interventions. Laboratories are now mandated to report levels of ≥10 µg/dL.

According to the 2015 Illinois ABLR annual report:

- ABLR made 11 referrals to the Occupational Safety and Health Administration (OSHA) for 6 companies with employees who had BLL ≥40µg/dL in calendar year 2015. These quarterly ABLR reports to OSHA led to two safety inspections that resulted in proposed fines totaling $17,960 in OSHA violations.
- ABLR notified OSHA within 24 hours of any case with an EBLL ≥60 µg/dL.
- Data collection and OSHA notification continues at ≥40µg/dL BLL.
- **Funding and other resources:** In 2013, National Institute of Occupational Safety and Health (NIOSH) cancelled all contracts to fund state Adult Blood Lead programs in accordance with the Budget Control Act of 2011. Due to lack of funding, ABLR staff only recorded cases of ≥40µg/dL to refer employees with BLL ≥40µg/dL to OSHA per the memorandum of understanding. Reports for cases between 10µg/dL and 40µg/dL were archived.
- In 2015, ABLR Division staff developed a new database that automated the entry of electronic reports and streamlined the manual data entry of paper reports. During the 2014 calendar year, 3,278 lab reports were added to the ABLR database while 3,067 lab reports were added to the ABLR database during 2015.

Illinois Health and Hazardous Substances Registry Annual Reports:
http://dph.illinois.gov/sites/default/files/publications/ihhsr-ann-rpt-29-fy15-040816.pdf

For more information on the Illinois ABLR visit:
http://dph.illinois.gov/data-statistics/epidemiology/occupational-disease-registry

Blood Lead Testing During Pregnancy

In October of 2015, the Program started collecting blood lead data on pregnant persons as enacted by the ACT (410 ILCS 45/6.2, Testing children and pregnant persons). Preliminary data is displayed on Table 14. ***http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1523&ChapterID=35***

Table 14: Distribution of Age and Blood Lead Levels for Pregnant Persons

Mean Age (years)	**26**			
Age Range (Years)	**14 - 52**			
Mean BLL	**1.4**			
BLL, µg/dL	**N**	**%**	**Capillary, %**	**Venous, %**
BLL Range	0 – 31		<1 – 31	<3
<1	501	71.4	96.2	3.8
1-4	187	26.6	99.5	0.5
5-9	6	0.9	100	0
≥10	8	1.1	100	0
Pregnant Persons Tested	**702**		97.1	2.9

Source: Illinois Department of Public Health - Illinois Lead Program Database 2013-2015.
*This is an ongoing study. No case management or environmental investigations were performed in 2015. Numbers were collected from October 2015 – June 2016. BLL implies blood lead level.

Potential adverse health effects on pregnancy

- Gestational hypertension
- Spontaneous abortion
- Low birthweight
- Impaired neurodevelopment

Each 1 µg/dL increase in umbilical cord blood lead was found to be associated with a reduction of 0.6 points in the mental development index scores of the Bayley Scales of Infant Development at age 3 months, with similar results at age 6 months (Dietrich et. al. 1987).

For more information on lead screening during pregnancy and lactation, refer to:
http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Lead-Screening-During-Pregnancy-and-Lactation

Common risk factors for lead poisoning in pregnant women

- Past exposures
- Recent immigration status
- Consumption of non-food items (pica)
- Consumption of lead-contaminated water
- Occupation or hobbies
- Cultural practices, (e.g., use of traditional medications or cosmetics)
- Use of traditional lead glazed pottery
- Nutritional status

Management of blood lead levels of pregnant persons

A pregnant person with a blood lead level ≥10 µg/dL should have an obstetric evaluation, regardless of whether symptoms are present. Special attention should be directed to:

- The pregnant person's detailed health history, including the presence or absence of clinical symptoms, the existence of pica, nutritional status (especially iron and calcium intake), dietary habits, family history of lead poisoning, potential sources of lead exposure (including exposure due to home renovation), and previous blood lead measurements
- Detailed hobbies and occupational histories of adults in the household
- Detailed environmental histories where the pregnant person resides or frequents
- The physical examination, with particular attention to the neurological examination and psychosocial and language development
- A neurobehavioral evaluation may be useful in pregnant persons receiving chelation therapy
- Evaluation of ferritin levels

Reference guidelines for medical referrals

- The Preventing and Testing for Childhood Lead Poisoning – A Reference Guide for Physicians and Health Care Providers ***http://dph.illinois.gov/sites/default/files/publications/preventing-and-testingfor-childhood-lead-poisoning-areference-guidefor-physicians-and-healthcare.pdf***
- Guidelines for the Identification and Management of Lead Exposure In Pregnant and Lactating Women ***http://www.cdc.gov/nceh/lead/publications/LeadandPregnancy2010.pdf***
- American Academy of Pediatrics guidelines ***http://pediatrics.aappublications.org/content/116/4/1036.full***

Economically, the elimination of lead poisoning leverages large payoffs for the state of Illinois. Educational costs could be substantially increased because lead poisoning irreversibly damages a child's brain, thereby making it more difficult for a child to learn (Reyes, 2014[1] Gould, 2009[2]). Additionally, a 2007 economic analysis estimated that children born in 2002 who were exposed to lead would earn more than $3 billion less over their lifetimes (IDPH, 2007[3]). Furthermore, these children would require an extra $31 million to cover the added educational needs and medical expenses resulting from lead exposure.

Source: *[1]Reyes, JW. The Social Cost of Lead - Effects on Academic Performance and Behavior. 2014.* ***http://www.cityofboston.gov/images_documents/Jessica%20Reyes.%20Social%20Cost%20of%20Lead_tcm3-48540.pdf***
[2]Gould E. Childhood lead poisoning - conservative estimates of the social and economic benefits of lead hazard control. Environ Health Perspect. 2009 Jul;117(7):1162-7. doi: 10.1289/ehp.0800408. Epub 2009 Mar 31.
[3]Illinois Department of Public Health. 2007. Illinois Lead Safe Housing Advisory Council Recommendation, Report to the Illinois General Assembly pursuant to P.A. 93-789.

Lead Poisoning Prevention Activities

A. Educational Activities

Health professionals providing health care education to parents and guardians of small children and pregnant women play an important role in the primary prevention of lead poisoning. Understanding lead poisoning evaluation methods for lead exposure and blood testing requirements for children and pregnant women is imperative when preventing lead poisoning.

The Program's regional nurses and the education coordinator conducted one-day lead poisoning prevention training sessions at two of the regional offices of IDPH. A total of 44 health care professionals were trained on lead poisoning in 2015 and Continuing Education Credits (CEUs) were accorded to qualifying participants. Topics covered in the training included:

- Case management and case follow-up
- Health effects and treatment of lead poisoning
- Specimen collection, submission and analysis at IDPH's Division of Laboratories
- Environmental case follow-up and compliance investigations for lead-poisoned children

Additionally, a webinar was conducted to explain the use of the CDC STELLAR program. Agencies conducting lead poisoning prevention activities use the STELLAR program for better utilization of data collection. The recorded STELLAR training is available on IDPH website for all personnel in understanding the use of the data collection and analysis system.

IDPH strives to increase lead poisoning awareness and promote lead safe behaviors by implementing strategies toward the prevention of lead poisoning through education, risk evaluation, and early detection. IDPH encourages all clinicians to use the evaluation tools when determining the risk of lead exposure in children and pregnant persons; the need to obtain a blood lead test to determine a blood lead level; and reporting blood lead test results.

For more information on the one-day lead poisoning prevention training sessions, contact the Program at 217-524-2081.

Childhood lead exposure can be minimized or prevented through increased public awareness:

1. Apply lead-safe work practices when disturbing lead-based paint
2. Keep the play, study, and living areas of children clean
3. Children should eat a healthy diet that includes calcium and iron
4. A road map of educational interventions for children affected by lead has been developed by the National Center for Environmental Health by an expert panel of CDC and non-CDC authors. Link to Figure 2 on page 44 of the link: ***http://www.cdc.gov/nceh/lead/publications/Educational_Interventions_Children_Affected_by_Lead.pdf***
5. A blueprint for lead poisoning prevention strategies integrating health, affordable housing, and education was developed by the National Center for Healthy Housing.

For more lead poisoning prevention tips, visit CDC at ***http://www.cdc.gov/nceh/lead/tips.htm.***

B. Lead Licensees

IDPH is the responsible agency in Illinois for administration and enforcement of the Act, 410 ILCS 45/1 et. seq. The Act provides authority for IDPH to license inspectors, risk assessors, workers, supervisors and contractors who conduct lead-based paint-related activities pursuant to the Code.

IDPH requires any person who wishes to conduct lead services in a regulated facility in Illinois to be appropriately licensed. The Program reviews and issues lead licenses for the following: lead abatement workers, lead abatement supervisors, lead inspectors, lead risk assessors, lead abatement contractors, and lead training course providers. Licenses expire annually and must be renewed (Table 15).

- Risk assessor and inspector licenses expire on December 31
- Worker and supervisor licenses expire March 31
- Contractor licenses expire May 31
- Training course provider certifications expire October 15

Table 15: Lead Licenses Issued in 2013-2015

	2013			2014			2015		
	Total	**New**	**Renewed**	**Total**	**New**	**Renewed**	**Total**	**New**	**Renewed**
Worker	**1,107**	320	787	**871**	247	624	**950**	217	733
Supervisor	**545**	43	502	**406**	20	386	**506**	45	461
Inspector	**97**	3	94	**62**	9	53	**64**	5	59
Risk Assessor	**554**	24	530	**308**	16	292	**349**	18	331
Contractor	**196**	21	175	**164**	15	149	**168**	18	150

Source: Illinois Department of Public Health - Illinois Lead Program Database 2013-2015

Lead training course providers were required to submit notification of all upcoming lead courses to IDPH no later than seven calendar days prior to the start of all IDPH-approved courses (Table 16).

Table 16: Total Number of Notifications and Actual Lead Courses Held in 2013-2015

Class notifications and courses held*	**2013**	**2014**	**2015**
Notifications of upcoming lead courses received by the Department	388	408	390
Actual number of lead courses held	181	207	262

Source: Illinois Department of Public Health - Illinois Lead Program Database 2013-2015.
*These numbers do not include RRP courses

In 2015, a total of 32 training course providers were approved to teach 136 approved classes compared to 29 providers for 118 classes in 2014. Table 17 reflects the breakdown of the number of approved Training Course Providers and the classes they were approved to teach.

Table 17: Total Number of Approved Training Courses and Providers in 2013-2015

Courses and Providers		2013	2014	2015
Approved Training Course Providers		**33**	**29**	**32**
Approved Classes for Training Course Providers				
	Worker Initial	11	13	16
	Worker Refresher	11	12	16
	Spanish Worker Initial	3	3	2
	Spanish Worker Refresher	2	2	2
	Polish Worker Refresher	0	2	1
	Supervisor Initial	12	11	14
	Supervisor Refresher	13	13	14
	Inspector Initial	4	5	4
	Inspector Refresher	6	6	6
	Risk Assessor Initial	4	5	4
	Risk Assessor Refresher	6	7	6
	RRP Initial	27	23	24
	RRP Refresher	15	16	22
	Total approved Classes for Training Course Providers	**114**	**118**	**136***

Source: Illinois Department of Public Health - Illinois Lead Program Database 2013-2015. *Includes 5 approved 'alternative courses'

All new license applicants for lead abatement supervisor, lead inspector, and lead risk assessor licenses were required to take and pass the third party examination administered by IDPH (Table 18).

Table 18: Total Number of Third Party Examinations

Lead License Type	2013	2014	2015
Supervisor	64	65	64
Inspector	5	8	6
Risk Assessor	40	26	25

Source: Illinois Department of Public Health - Illinois Lead Program Database 2013-2015.

For approved training providers, go to:
https://data.illinois.gov/Public-Health/Lead-Training-Course-Provider-List/wwdj-394b

C. CLEAR-Win

The Comprehensive Lead Education, Reduction and Window Replacement Program (CLEAR-Win) was a pilot program aimed at reducing potential lead hazards by replacing windows in low-income, pre-1978 homes. CLEAR-Win also provided for on-the-job training for community members in two pilot communities of Englewood/West Englewood (Chicago) and Peoria County.

CLEAR-Win was the nation's first state-funded, primary prevention, window replacement program wherein original, wood-sashed windows in older homes were replaced using lead-safe work practices. Over three years, the CLEAR-Win project provided for the installation of nearly 8,000 windows in 466 housing units. Two independent studies were performed for CLEAR-Win: one by the University of Illinois at Chicago and the other by the University of Illinois at Urbana-Champaign. Both of these studies concluded that the project was overwhelmingly successful at lowering the lead burden in the homes where window replacement was conducted, and that the return on investment was almost two dollars for every dollar spent.

A comprehensive report with details on health benefits, lead hazard alleviation, home value after window improvement, and energy savings has been published on IDPH web site.
For more information on the CLEAR-Win, refer to:
http://dph.illinois.gov/sites/default/files/publications/publications-ohp-clear-winreport-042016.pdf or contact the Illinois Lead Program at 217-782-5830.

D. Intervention - Case Management of Lead-Poisoned Children

As adapted from CDC, case management includes:
a) Identification of lead-poisoned child and home visit
b) Individual assessment and diagnosis
c) Service planning and resource identification
d) Linkage of clients to needed services
e) Service implementation and coordination
f) Monitoring of service delivery
g) Advocacy, and
h) Evaluation.

Comprehensive case management is initiated for children with a confirmed venous BLLs ≥10 µg/dL. Once a child is identified with an EBLL, a Public Health Nurse visits the child's residence to assess factors that may be contributing to the child's EBLL. Case management activities include education about sources of lead, nurse home visits for family interaction and referrals to appropriate services linked to medical, nutritional supplementation and developmental testing. Follow-up venous blood lead testing is encouraged by using the recommendations from the CDC and American Academy of Pediatrics.

During nursing case management visits, families of affected children were provided educational materials related to lead exposure and prevention. Families were also provided the Tobacco Quitline referral number (1-866-QUIT-YES) for those interested in cessation of the use of tobacco products as well as other educational materials relating to the prevention of home hazards.

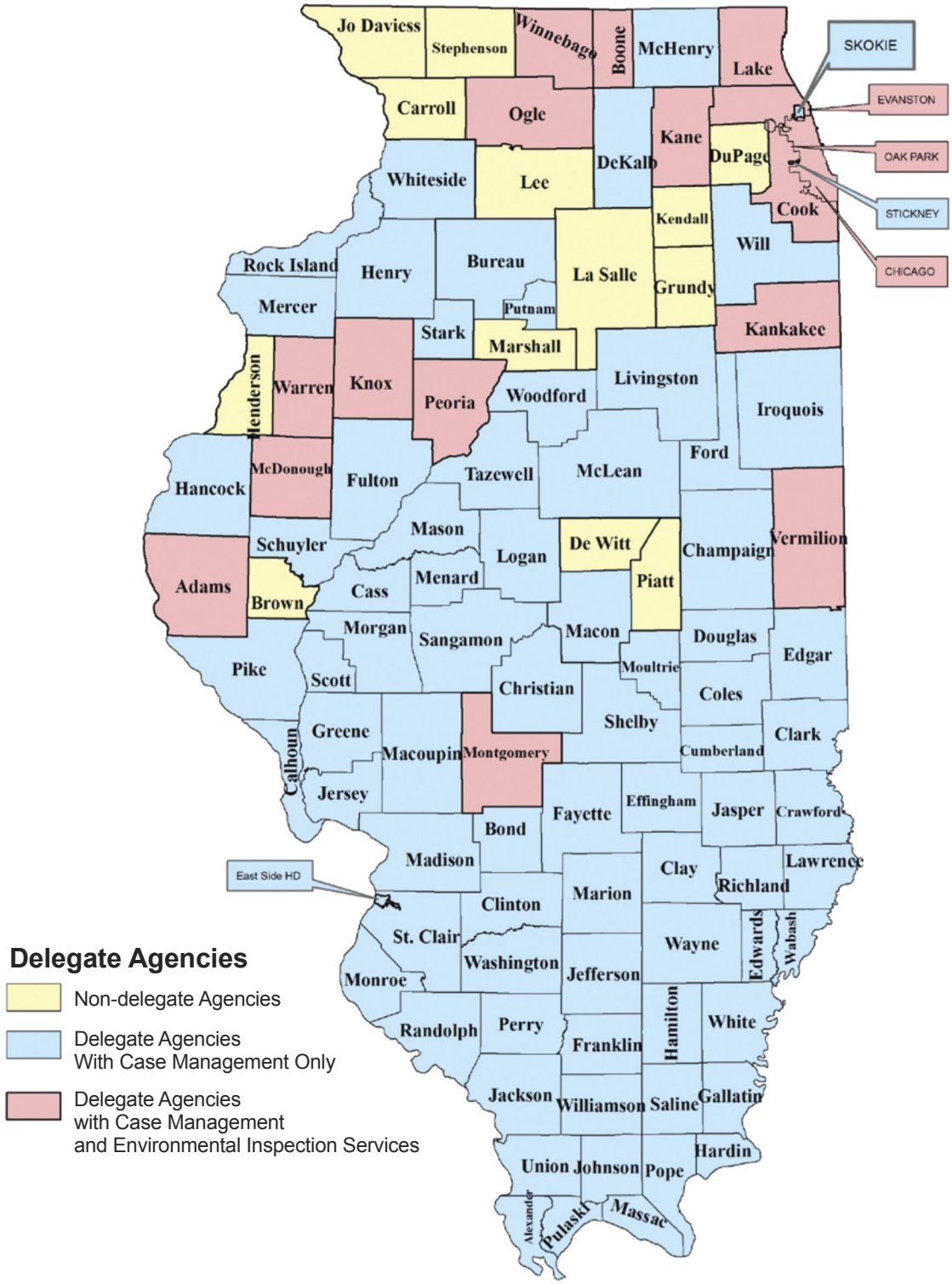
IDPH had grant agreements during 2015 with 84 delegate agencies to provide case management care for lead-poisoned children in 89 of 102 counties. In collaboration with IDPH, these delegate agencies provide outreach and education to health care providers, families of lead-poisoned children and the general public. Each of the delegate agencies used the STELLAR data processing system to maintain records for case management of children in their jurisdiction.

Local health departments without a delegate agency agreement are considered non-delegate agencies. There were 13 non-delegate agencies where case management services were provided by the Illinois Lead Program regional nurse consultants (Table 19 and Figure 11).

Table 19: Non-delegate Agencies with Case Management Services provided by IDPH in 2015

Brown County	Carroll County	Dewitt County	DuPage County	Grundy County
Henderson County	Jo Daviess County	Kendall County	La Salle	Lee County
Marshall County	Piatt County	Stephenson County		

Figure 11: Illinois Lead Program Delegate and Non-delegate Agencies in 2015



Source: Illinois Leads Program Surveillance Database, 2015.
Created 08/23/2016.

Note that Ogle County environmental inspection services are performed by Boone County

Capillary blood draw also known as 'finger stick', is a blood sample collected by pricking the fingertip. A capillary blood draw is a preliminary test only. A confirmatory test with a blood draw from the vein is required before case management begins. Table 19 reflects the recommended testing schedule for follow-up of children with capillary blood lead results to obtain a venous confirmatory test. Venous blood draw is most preferred by the Department in order to avoid false positive results.

Table 20: Obtaining a Confirmatory (Venous) Test for Follow-up of Capillary Blood Draw

Capillary BLL, µg/dL	Time for Confirmatory Testing
5 – 9	1 – 3 months
10 – 19	1 – 3 months
20 – 44	1 week – 1 month
45 – 49	48 hours
60 – 69	24 hours
≥ 70	Immediately as an emergency test

Source: ***http://dph.illinois.gov/sites/default/files/publications/lead-testing-and-case-followup-guidelinesfor-local-health-departments-042116.pdf***

The higher the BLL is the more urgent the need for confirmatory testing. However, some case managers or physicians may choose to repeat blood lead tests on new patients within a month to ensure their BLL is not rising more quickly than anticipated. IDPH recommends follow-up testing for 10 – 19 µg/dL at 1 – 3 months. Table 20 also indicates the recommended schedule for follow-up testing of children with different levels of confirmed venous blood lead tests.

Table 21: Follow-up Blood Lead Testing After a Confirmatory (Venous) Blood Draw

Venous Blood Lead level µg/dL	Early follow-up testing (2-4 tests after identification)	Later follow-up testing after blood lead level is declining
10 – 14	3 months*	6 - 9 months
15 – 19	1 – 3 months*	3 – 6 months
20 – 24	1 – 2 months*	1 – 3 months
25 – 44	2 – 4 weeks	1 month
≥ 45	As soon as possible	Chelation with subsequent follow-up

Source: Some case managers or physicians may choose to repeat blood lead tests on new patients within a month to ensure their BLL level is not rising more quickly than anticipated. NOTE: Reference value ≥5 µg/dL.

Common sources of lead identified during nurse home visits

- Chipping/Peeling paint
- Dusty carpets or flooring
- Renovation
- Soil or dust
- Peeling/chipping furniture
- Toys, herbs, and candies from foreign countries

Questions that Parents frequently ask during Case Management Home Visit

1. *Is lead found in toys? — Lead is rarely found in toys but may be in some household items. Lead-based paint remains the most common source of childhood lead exposure.*
2. *Does a child have to eat paint chips to be lead-poisoned? — While paint chips, if eaten, are a source of lead poisoning, the most common source is the ingestion of lead-contaminated dust through hand-to-mouth behaviors.*
3. *What does lead poisoning actually do to the body? — Lead can interfere with brain development, contribute to behavior problems and a lowered IQ, and may cause other serious health problems.*
4. *What can I do to reduce my child's exposure to lead? — Educate yourself on lead hazards and lead safe work and housekeeping practices. Wash hands frequently.*
5. *How long will it take for the blood lead level to decrease? — It varies depending on the child's health status, medical treatment, and how quickly the source of the lead is eliminated from the child's environment.*

E. Intervention - Environmental Follow-up of Children with Lead in their Blood

The local or regional health department conducts environmental lead investigations to identify lead hazards. The health department risk assessor develops a letter and report that are provided to the property owners who are then required to submit a mitigation plan to IDPH or local health department for review and approval.

IDPH has six regional offices, as presented on Table 22 and Figure 11. Based on 2015 data, 514 children were identified for the first time with confirmed venous BLLs ≥10µg/dL. There were 2,348 children tested for the first time in 2015 with BLLs ≥5µg/dL.

Table 22: Children Tested for Blood Lead for the First Time in 2015 by Region

Children Tested for Blood Lead for the **FIRST TIME** in 2015		Central Office	Champaign Region	Marion Region	Edwardsville Region	Peoria Region	Rockford Region	West Chicago Region	**TOTAL (N)***
Total Number of Children Tested for the **FIRST TIME**			4,675	5,345	9,711	10,496	5,989	79,075	**124,365**
Confirmed cases of blood lead identified for the first time in 2015 (**Incidence**)	≥10 µg/dL		12	17	30	97	39	306	**514**
	≥5 µg/dL		40	37	98	262	119	1,663	**2,348**

Source: Illinois Department of Public Health – Illinois Lead Program Surveillance Databases 2015. *A totals 9,074 children had missing or suppressed addresses. Of those children, 13 had BLLs ≥10µg/dL and 129 of the children had BLLs ≥5µg/dL

In calendar year 2015, IDPH had grant agreements with 16 delegate agencies to provide environmental inspection services in addition to case management services (Table 23 and Figure 12).

Table 23: Delegate Agencies with Case Management and Environmental Investigation Services in 2015

Adams County Health Department	Boone County Health Department	Chicago Department of Public Health	Cook County Health Department
Evanston Health Department	Kane County Health Department	Kankakee County Health Department	Knox County Health Department
Lake County Health Department	McDonough County Health Department	Montgomery County Health Department	Oak Park Health Department
Ogle County Health Department*	Peoria County Health Department	Vermilion County Health Department	Warren County Health Department
Winnebago County Health Department	*Note: Ogle County environmental inspection services are performed by Boone County		

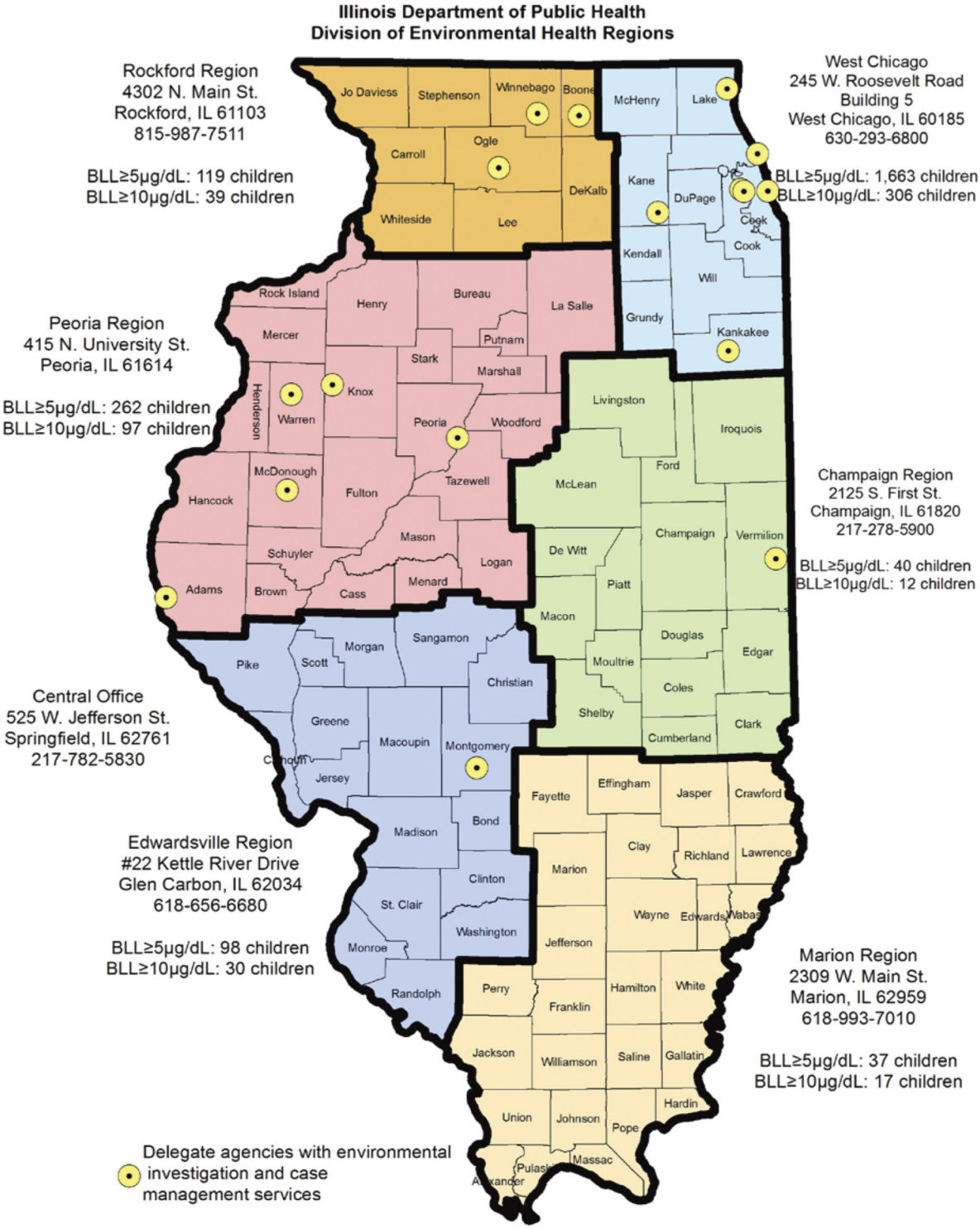
The Program served areas not covered by a delegate agency agreement. The six environmental regional offices of IDPH each had lead risk assessors who conducted home inspections for children with blood lead at the Illinois action level in accordance with the Act. Environmental services included comprehensive risk assessment, follow-up inspections, and approving lead mitigation or abatement activities.

Environmental remediation is required by law when a lead hazard has been identified in a home where a child with an EBLL lives or frequents. Remediation is necessary to prevent on-going exposure to lead hazards. Children who receive medical chelation and laterho return to lead hazards are at even greater risk for exposure.

After remediation were completed, compliance certificates were issued by IDPH regional risk assessors. Environmental assessment cases were closed in 2015 for any of the following reasons:

- No lead hazard identified
- Venous BLL was ≥10µg/dL
- Residence or occupant not located
- Regulated facility demolished
- Other residence investigated

Figure 12: Children with Blood Lead Levels at Federal Reference Levels Identified for the First Time in 2015 by Environmental Health Regions



Source: Illinois Leads Program Surveillance
Created 09/19/2016.

F. Compliance and Enforcement

Following the Act and Code, IDPH:

- Conducted on-site investigations of lead mitigation/abatement projects statewide per notifications received by IDPH central office:
  - Determined if individuals on-site were properly licensed
  - Ensured lead mitigation/abatement projects were conducted in compliance with the Act and Code
- Sought enforcement action against persons found in violation of the Act and Code, including but not limited to: persons performing lead services, such as lead inspection, risk assessment, mitigation and abatement
- Generated a summary compliance and enforcement action report for IDPH activities

Peer Reviewers not pictured: Kate Abitogun, Roxane Fleming, and Eddie Simpson

Illinois Lead Poisoning Elimination Advisory Council

The Illinois Lead Poisoning Elimination Advisory Council (Council) met quarterly with the mission to develop and implement a comprehensive statewide strategic lead poisoning prevention plan, foster partnerships, and collaborate in primary prevention, intervention, surveillance, and evaluation.

The Program has utilized the Council since 1998. There are currently 40 members on the council from different disciplines and backgrounds consisting of:

- pediatricians
- local health department staff
- representatives from housing agencies, nonprofit, and faith-based organizations
- universities
- hospitals
- representatives from Federal, State, and Municipal governments, and the private sector.

The Council has been used extensively for recommendations for direction and improvement in lead poisoning prevention throughout the state. The Council is composed of three subcommittees:
1) Education and Outreach
2) Policy and Regulations
3) Data and Evaluation

Members of the Data and Evaluation committee published an article in the Department's Second Issue of Illinois Morbidity and Mortality Bulletin titled "Childhood Lead Exposure, Testing Rate, and Blood Lead Poisoning Prevalence in Illinois and Chicago, 1996-2012." This article may be found at:
http://www.dph.illinois.gov/sites/default/files/publications/immb-vol1-issue2-040816.pdf

At least one member from the Program sits on each subcommittee, which has a non-Program facilitator. The Council provides direction to the Program on outreach activities, training for identification of lead-related hazards, referral directions and other partnership recommendations. The Council continues to evolve into a dynamic group seeking to improve the quality of life for those affected by lead hazards.

The Program has collaborated with entities such as superintendents of schools, realtor associations, home builder/remodeler firms, window manufacturing/assembly companies, and municipal code enforcement agencies for additional sources to further educate the private sector regarding lead hazards and reduce the incidence of lead poisoning. Partnerships such as these result in positive interventions for elimination of childhood lead poisoning, especially among the underserved and at-risk populations.

For more information on the Council, contact the Division of Environmental Health at 217-782-3517.

Links to References Used in the Annual Surveillance Report

Illinois Department of Public Health (IDPH): Lead Poisoning Prevention Act, P.A. 87-175. 410 ILCS 45/1) (from Ch. 111 1/2, par. 1301 ***http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1523&ChapterID=35***

IDPH: Lead Poisoning Prevention Code, 77 IL. Admin Code 845
http://www.ilga.gov/commission/jcar/admincode/077/07700845sections.html

CDC's National Surveillance Data (1997-2015) ***http://www.cdc.gov/nceh/lead/data/national.htm***

CDC: Lead Toxicity- How Are People Exposed to Lead? ***http://www.atsdr.cdc.gov/csem/csem.asp?csem=7&po=6***

U.S. EPA: Lead ***https://www.epa.gov/lead***

U.S. Food and Drug Administration (FDA): Drugs - Drug Safety and Availability, FDA warns consumers about health risks with Alikay Naturals – Bentonite Me Baby – Bentonite Clay
http://www.fda.gov/Drugs/DrugSafety/ucm483838.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery

U.S.EPA: Safe Drinking Water Act (***http://www.epa.gov/sdwa***)

U.S. EPA: Lead and Copper Rule ***http://www.epa.gov/dwreginfo/lead-and-copper-rule***

Illinois Polluting Control Board Regulations (IPCB): Primary Drinking Water Standards for Public Water Supplies under the authority of the Safe Drinking Water Act in Illinois (35 IAC Part 611 IPCB, includes the Lead/Copper Rule)
(***http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.aspx***)

U.S. EPA: Protect Your Family from Exposures to Lead ***https://www.epa.gov/lead/protect-your-family-exposures-lead***

CDC: Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women
http://www.cdc.gov/nceh/lead/publications/LeadandPregnancy2010.pdf

U.S. Consumer Product Safety Commission (CPSC): Report an unsafe product – Children's Product
http://www.cpsc.gov/Business--Manufacturing/Business-Education/childrens-products/

CDC: Lead – Water ***http://www.cdc.gov/nceh/lead/tips/water.htm***

IDPH: The Public Area Sanitary Code, 77 IAC 895 ***http://www.ilga.gov/commission/jcar/admincode/077/07700895sections.html***

IEPA ***http://water.epa.state.il.us/dww/Maps/Map_Template.jsp***

U.S. EPA: Ground Water and Drinking Water ***http://www.epa.gov/safewater/dwinfo/index.html***

U.S. EPA: Ground Water & Drinking Water- frequent questions ***https://safewater.zendesk.com/hc/en-us***

National Ground Water Association ***http://www.wellowner.org***

Environmental Science and Technology: Detection and Evaluation of Elevated Lead Release from Service Lines: A Field Study
http://pubs.acs.org/doi/abs/10.1021/es4003636

IEPA/IDPH: Preliminary Report on Lead in Public Water Systems
http://dph.illinois.gov/sites/default/files/publications/publicationsohpiepa-preliminary-report-lead-pws.pdf

Scorecard – The Pollution Information Site ***http://scorecard.goodguide.com/env-releases/lead/***

Epoch Times: Lead Poisoning a Significant Cause of Inner-City Crime, Say Researchers
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IDPH: Clear-Win Pilot Phase Evaluation
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Additional Resources

Illinois Lead Program
Illinois Department of Public Health
525 W. Jefferson St.
Springfield, Il 62761
Phone: 866-909-3572 or 217-782-3517
The hearing impaired may dial 800-547-0466
http://dph.illinois.gov/topics-services/environmental-health-protection/lead-poisoning-prevention

Illinois Public Health Association (IPHA) ***http://www.ipha.com***

American Public Health Association (APHA) ***http://www.apha.org***

National Center for Healthy Housing (NCHH) ***http://www.nchh.org/***

U.S. Centers for Disease Control and Prevention (CDC) ***http://www.cdc.gov/nceh/lead/***

U.S. Consumer Product Safety Commission (CPSC) ***http://www.cpsc.gov/***

U.S. Department of Housing and Urban Development (HUD) ***http://www.hud.gov/***

U.S. Environmental Protection Agency (U.S. EPA) ***http://www.epa.gov/***

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