



# The Impact of Lead



Illinois Lead Program  
Annual Surveillance Report  
2008



# Illinois Lead Program Annual Surveillance Report 2008



A publication of the  
Illinois Department of Public Health  
Division of Environmental Health  
Illinois Lead Program  
Springfield, Ill. 62761

December 2009





Pat Quinn, Governor  
Damon T. Arnold, M.D., M.P.H., Director

525-535 West Jefferson Street • Springfield, Illinois 62761-0001 • [www.idph.state.il.us](http://www.idph.state.il.us)

December 2009

Dear Colleagues,

The Illinois Lead Program is pleased to present the 2008 annual surveillance report. The report provides information on the number of children screened and identified with lead poisoning by county, age, race and blood lead levels. The report also presents activities related to the Healthy Homes Initiative. The program is committed to the Healthy People 2010 goal of eliminating elevated blood lead levels in children.

Every year since 1997, an average of 270,000 Illinois children are tested for lead poisoning. The number of lead poisoned children has steadily declined from 45,809 (18.7 percent) in 1997 to 5,126 (1.7 percent) in 2008. The Illinois Lead Program, its delegate agencies and local health departments provided follow-up case management services to 3,451 confirmed cases of lead poisoned children in 2008. Case management activities included nurse home visits, education, and referrals for related services. In accordance with the Illinois Lead Poisoning Prevention Act, 2,489 inspections were initiated at dwellings and common play areas of children with lead levels of 10 micrograms per deciliter or higher.

There is no safe level of lead in the body. Children suffer from neurological problems when exposed to lead and the problem may persist through adulthood. There are about 44,445 known children in Illinois with lead levels between 5 micrograms and 9 micrograms per deciliter. Studies relate childhood lead poisoning to decreased IQ, attention deficit hyperactivity disorder (ADHD), hearing impairment, disrupted balance and impaired peripheral nerve function.

Although lead poisoning is a preventable environmental health hazard that can affect any family, disparities to exposure exist. Children between 1 and 3 years of age are at highest risk for lead poisoning due to their hand-to-mouth activities. African-American children are twice as likely to be affected by lead poisoning compared to Caucasian children. Hispanics and Asians also exhibit elevated lead levels.

Lead-based paint, abundant in pre-1978 housing, is the primary source of lead poisoning in children. Almost 2 million Illinois housing units built before 1978 are estimated to have lead. The United States Environmental Protection Agency's Renovation, Repair and Painting Rule will become effective on April 22, 2010. This rule requires the use of lead-safe work practices by contractors when remodeling pre-1978 housing and child care facilities. This rule should provide additional protection against lead poisoning in children.

We look forward to a new and continued collaboration with our partners at the federal, state, and local levels as the Illinois Lead Program continues to tackle the prevention of lead poisoning in children.

Sincerely,

Damon T. Arnold, M.D., M.P.H.  
Director

***Improving public health, one community at a time***

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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.idph.state.il.us/envhealth/ehpublications.htm#lead>**

**The hearing impaired may dial 800-547-0466**







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## Introduction

The mission of the Illinois Lead Program (ILP) is to eliminate the incidence of childhood lead poisoning. The program is committed to the Healthy People 2010 goal of eliminating elevated blood lead levels in children. In 2008, a total of 5,126 known Illinois children had elevated levels of 10 micrograms of lead per deciliter of blood compared to 45,809 children in 1997. According to the “Get the Lead Out Program,” it costs \$8,000 to \$9,000 to remediate the home of a lead poisoned child in Illinois. A national cost-benefit analysis of lead hazard control indicates that each dollar invested in lead hazard control results in a return of \$17 to \$221<sup>(1)</sup>.

The Illinois Department of Public Health's community-based Illinois Lead Program has monitored the identification and treatment of lead poisoned children and identified sources of lead poisoning since 1973. The program began primarily as a blood lead registry with a few programs operating from their own budgets. In 1992, the Department realized that a coordinated statewide effort would be more productive. In 1993, a strategic plan was developed; the first high-risk ZIP code for pediatric lead poisoning was designated and new testing and reporting laws were adopted. In 2006, the Illinois Lead Poisoning Prevention Act was amended to initiate environmental investigations of homes of lead poisoned children 3 years of age and younger with blood lead levels greater than or equal to 10 micrograms per deciliter.

Originally the Illinois Lead Program maintained jurisdiction over the entire state. Starting in 1996, the city of Chicago has been funded separately by the U.S. Centers for Disease Control and Prevention (CDC) to run its own program and coordinate its efforts with the state of Illinois.

The information contained in this report is compiled by the Illinois Department of Public Health's Illinois Lead Program. Illinois law requires that all blood lead results of children 15 years of age or younger be reported to the Illinois Lead Program. The vast majority of 2008 tests (95 percent) were performed on children 6 years of age or younger.

This report is intended to serve as a standard reference for legislators, community-based organizations, city, state and federal agencies, as well as health researchers who seek information on screening and lead poisoning distribution in Illinois children.

Source: *1 Environ Health Perspect 117:1162–1167 (2009)*



## Summary Statistics on Illinois Childhood Lead Poisoning for Calendar Year 2008

**Table I.** Summary Statistics on Illinois Childhood Lead Poisoning for Calendar Year 2008

Variable	Total Tested		Percent of Elevated Blood Lead Levels of 10 Micrograms per Deciliter or Greater (%)
	Number (N)	Percentage (%)	
Total number of blood lead tests <sup>a</sup>	340,985		2.6
Total number of children tested	304,807	25 <sup>b</sup>	1.7
<b>Age (years)</b>			
Younger than 1	38,290	13	0.6
1	70,274	23	1.8
2	47,975	16	2.5
3	44,389	15	2.0
4	41,846	14	1.6
5	34,769	11	1.3
6 and older	24,817	8	1.6
<b>Gender</b>			
Female	145,388	48	1.5
Male	152,097	50	1.9
Undetermined	7,322	2	1.7
<b>Known Racial/Ethnic Distribution of Blood Lead Levels<sup>c</sup></b>			
African-American	18,068	5.9	5.7
White	30,278	9.9	2.8
Hispanic	8,263	2.7	5.0
Asian	1,104	0.4	5.1
<b>Blood Specimen Type</b>			
Capillary	183,782	60.3	1.3
Venous	120,554	39.6	1.9
Undetermined	471	0.2	11.9
<b>Laboratories Reporting Lead Results</b>			
Records With Missing Addresses	25,675	8.4	1.5
<b>Blood Lead Levels in Micrograms per Deciliter (µg/dL)</b>			
≤4	255,236	Source: Illinois Lead Program Surveillance Data 2008  a Data includes multiple tests per child b The 2007 estimated population of children 6 years of age and younger was 1,243,832. c Collection of race and ethnicity data remains a challenge	
5-9	44,445		
≥10	5,126		
10-14	3,024		
15-19	1,050		
20-24	433		
≥25	619		
≥45	97		

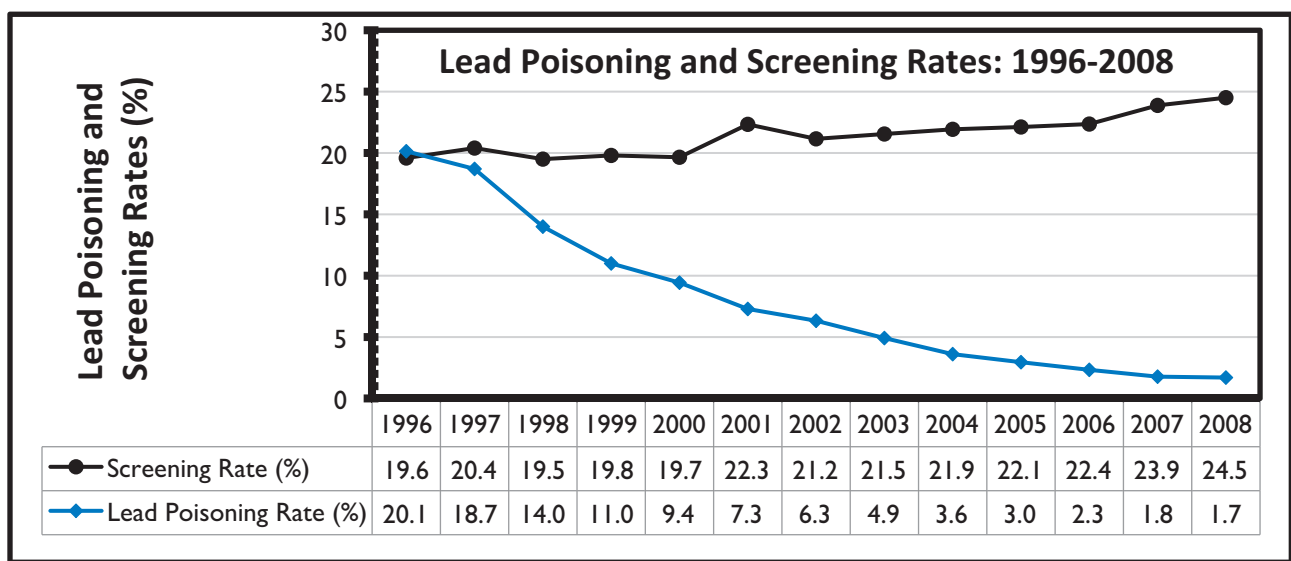


# Illinois Lead Poisoning and Screening Rates: 1996 - 2008

The significant decrease in blood lead poisoning rate in Illinois children from 20 percent in 1996 to 1.7 percent in 2008 is a public health success story. Figure 1 illustrates the screening and lead poisoning rates in Illinois children 6 years of age and younger. The lead poisoning rate is based on the percentage of children tested with blood lead levels of 10 micrograms per deciliter or above. The Illinois Lead Program is truly committed to the Healthy People 2010 goal of eliminating elevated blood lead levels in children. Since 1993, the program has successfully addressed childhood lead poisoning, overseeing the delivery of services to Illinois children with elevated blood lead levels, and fostering programs and partnerships to reduce exposures to lead. The program maintains the state lead database and routes information on children's blood lead levels to Chicago and all other delegate agencies.

The testing rate for blood lead poisoning has remained fairly constant with a slight increase from 19.6 percent in 1996 to 24.5 percent in 2008. Nationally, CDC reported a 14 percent testing rate for 2006.

Figure 1

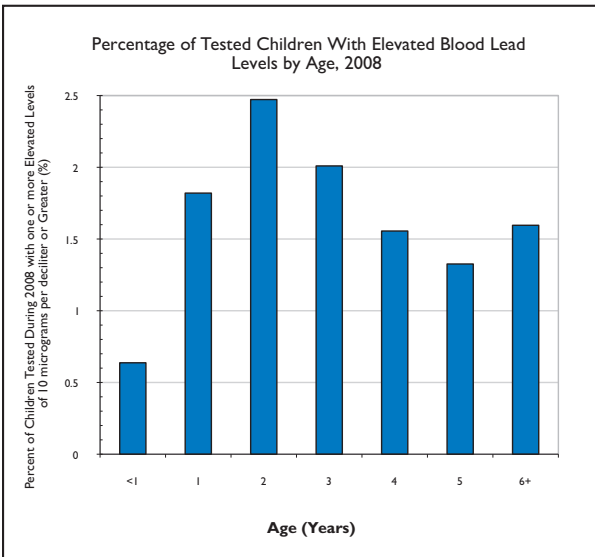


Source: Illinois Lead Program Surveillance Data, 1996-2008

- Note:** The Centers for Disease Control and Prevention reported a 2006 national testing rate of 14 percent.
- Screening rate: The total number of children younger than 72 months of age tested for blood lead levels divided by total number of children younger than 72 months of age, based on U.S. Census data per 100 population
  - Lead poisoning rate: The total number of children younger than 72 months of age with elevated lead levels of 10 micrograms per deciliter or greater divided by total number of children less than 72 months of age tested for blood lead

## Blood Lead Levels by Age: Age at Which Children Should be Tested

**Figure 2**



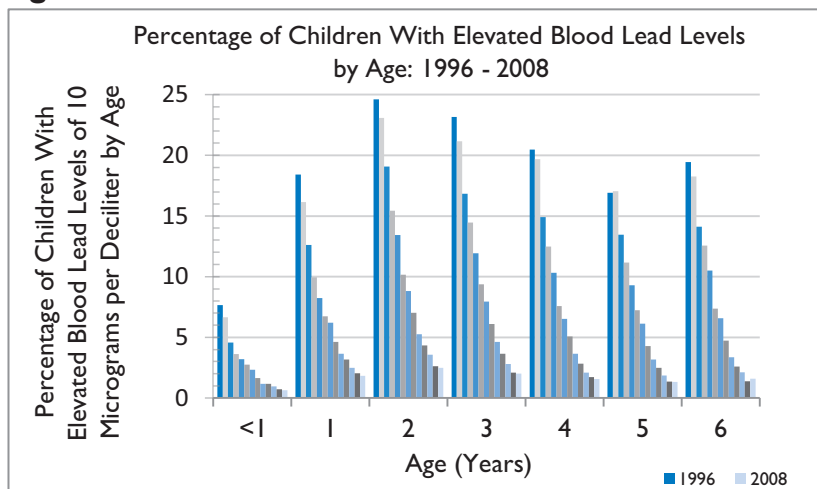
Source: *Illinois Lead Program Surveillance Data, 2008*

Although lead poisoning is a preventable environmental health hazard that can affect any family, disparities to exposure exist. Figure 2 indicates that Illinois children between the ages of 1 and 3 are at highest risk for lead poisoning. This may be attributed to their frequent hand-to-mouth activities.

Illinois law requires that children 6 months through 6 years of age who live in high risk areas be tested before attending a licensed day care, school, or kindergarten.

Early detection is important since damage from lead poisoning can be minimized or prevented when it is discovered early in an affected child's development. As Figure 2 suggests, children are most likely to become lead poisoned once they are able to crawl and walk. Therefore, the Illinois Department of Public Health, the American Academy of Pediatrics and the U.S. Centers for Disease Control and Prevention recommends that children be tested at 1 and 2 years of age for lead poisoning.

**Figure 3**



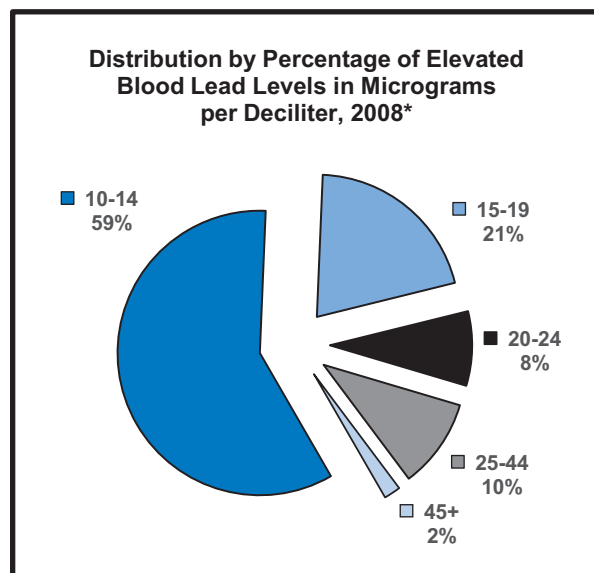
Source: *Illinois Lead Program Surveillance Data, 1996-2008*

Figure 3 shows that although the number of children with elevated lead levels has steadily and significantly declined, children 2 and 3 years of age have the highest levels of lead irrespective of the year of exposure.



## Distribution of Elevated Blood Lead Levels and Adverse Effects

Figure 4



Source: Illinois Lead Program Surveillance Data, 2008

Usually, at low levels, there are no overt signs or symptoms of lead poisoning. However, persistence of low levels of lead in blood may lead to developmental delays, learning problems and lower attention span. At moderate levels, blood lead can lead to constipation, abdominal pain, poor appetite, and even anemia. High levels of lead in the body can lead to poor appetite, vomiting, irritability, or lethargy.

Figure 4 shows that 59 percent of lead poisoned children in Illinois have lead levels between 10 and 14 micrograms per deciliter.

Table 2. Blood Lead Levels as Percentage of Illinois Children Tested by Year and Levels: 1996 – 2008

Year	Total Number of Children Tested	Elevated Blood Lead Levels as Percentage of Illinois Children Tested by Year and Levels: 2000 – 2008					
		5-9 µg/dL	10-14 µg/dL	15-19 µg/dL	20-24 µg/dL	25-44 µg/dL	45+ µg/dL
1996	235,290	38.3	11.8	4.7	1.8	1.7	0.19
1997	245,093	37.3	11.1	4.3	1.7	1.5	0.19
1998	234,417	35.1	8.8	2.8	1.1	1.0	0.14
1999	239,571	32.7	7.2	2.2	0.8	0.8	0.10
2000	244,442	31.7	6.1	1.9	0.8	0.6	0.08
2001	277,788	29.4	4.7	1.5	0.6	0.5	0.07
2002	263,069	28.5	4.1	1.3	0.5	0.4	0.06
2003	267,997	25.2	3.2	1.0	0.4	0.3	0.05
2004	272,757	22.7	2.4	0.7	0.2	0.2	0.03
2005	275,108	21.6	2.0	0.6	0.2	0.2	0.03
2006	278,078	19.9	1.6	0.4	0.2	0.2	0.03
2007	296,998	16.2	1.1	0.3	0.2	0.2	0.03
2008	304,807	14.6	1.0	0.3	0.1	0.2	0.03

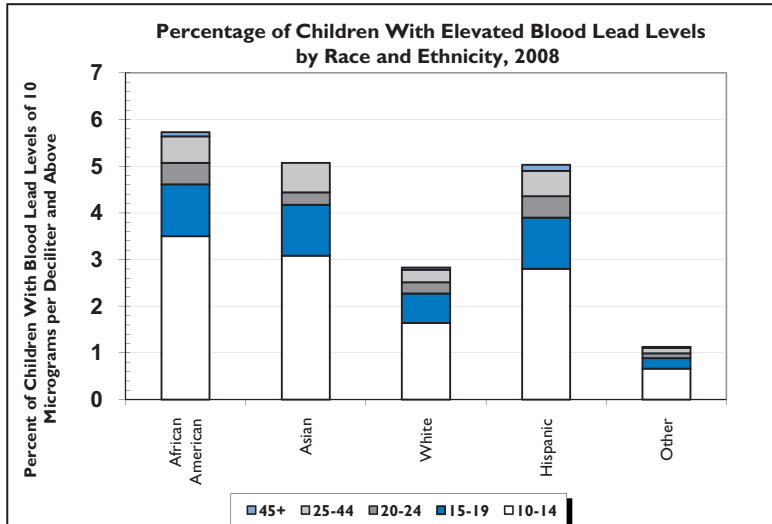
Source: Illinois Lead Program Surveillance Data, 1996-2008  
 I Roberts et al. J. Tox Clin Tox 2001

The number of children with severe levels of blood lead has decreased with time (Table 2). In 2008, 79 children (0.05 percent) had lead levels of 45 micrograms per deciliter and higher compared to 445 children in 1996 (0.19 percent). It usually takes about 24 months for half of the blood lead levels of more than 25 micrograms per deciliter to drop to 10 micrograms per deciliter<sup>1</sup>.



## Lead Poisoning, Race and Ethnicity

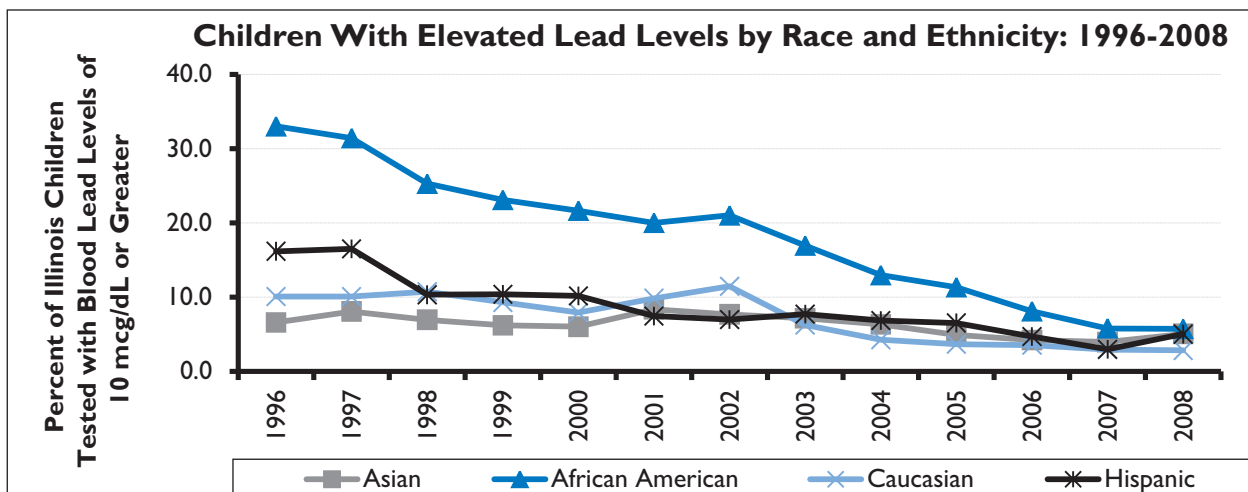
Figure 5



Source: Illinois Lead Program Surveillance Data, 2008

Lead poisoning is a preventable environmental health hazard that can affect any family. However, disparities to exposure do exist. Figure 5 indicates that African-American children are twice as likely to be affected by lead poisoning compared to Caucasians. African Americans are slightly ahead of Asian and Hispanic children. Lead poisoning in Asian children is on the rise. One logical explanation for disparity to lead exposure can be attributed to the fact that minorities are more likely to live in older housing, common to high-risk ZIP codes. While lead paint is the source of most lead poisoning cases, folk remedies and products containing lead also may contribute to the higher lead poisoning rates of minority children.

Figure 6



Source: Illinois Lead Program Surveillance Data, 1996-2008

## Lead Screening Activities

The remarkable disparity in lead poisoned children is a cause for concern. Efforts to continue the elimination of the preventable causes of lead poisoning among children of all races is highly recommended. Collection of race and ethnicity data remains a challenge. Figures 5 and 6, on the previous page, demonstrate the difference in lead poisoning by race and ethnicity. The chart reflects the elevated blood lead levels of children whose racial status were revealed.

Lead Screening Activities in Illinois, Chicago and United States: 2007-2008					
<b>Table 3. Lead Screening Activities in Illinois, Chicago and United States: 2007 - 2008<sup>1</sup></b>					
2007			2008		
<b>Illinois</b>					
Total children tested	296,998		Total children tested	304,807	
Results ≥ 10 µg/dL	5,270		Results ≥ 10 µg/dL	5,126	
Results ≥ 15 µg/dL	1,990		Results ≥ 15 µg/dL	2,102	
Lead poisoning rate	1.8%		Lead poisoning rate	1.7%	
<b>Chicago</b>					
Total children tested	105,788		Total children tested	116,164	
Results ≥ 10 µg/dL	2,627	49.8%	Results ≥ 10 µg/dL	2,306	49%
Results ≥ 15 µg/dL	957	48.0%	Results ≥ 15 µg/dL	942	49%
Lead poisoning rate	2.5%		Lead poisoning rate	2.0%	
<b>Illinois excluding Chicago</b>					
Total children tested	148,176		Total children tested	162,968	
Results ≥ 10 µg/dL	2,643	50.2%	Results ≥ 10 µg/dL	2,439	51%
Results ≥ 15 µg/dL	1,033	52.0%	Results ≥ 15 µg/dL	969	51%
Lead poisoning rate	1.8%		Lead poisoning rate	1.5%	
<b>USA (2006 ONLY<sup>2</sup>)</b>					
Total children tested	3,262,866				
Results ≥ 10 µg/dL	39,526				
Results ≥ 15 µg/dL	14,972				
Lead poisoning rate	1.2%				

Source: Illinois Lead Program Surveillance Data, 2007-2008, and Centers for Disease Control and Prevention (CDC) Blood Lead Surveillance Data, 2006

<sup>1</sup>The Illinois data includes capillary and venous tests to account for all the results reported to the Department. It also accounts for tests results obtained with hand-held analyzers. There were 43,033 records in 2007 and 25,675 records in 2008 with incomplete addresses making classification of all the data in Chicago and Illinois excluding Chicago challenging.

Note. <sup>2</sup>Only 2006 data is available from the Centers for Disease Control and Prevention (CDC) at this time.



## Population of Children, Number Tested, and Blood Lead Levels by County: 2007-2008

**Table 4.** Estimate of 2007 Population of Children, Number of Children Tested and Blood Lead Levels by County: 2007-2008

County	2007 Estimated Population of Children 6 Years and Younger	Total Tested	2007					Total Tested	2008				
			10- 14	15- 19	20- 24	25- 44	45+		5-9	10- 14	15- 19	20- 24	25+
			µg/dL						µg/dL				
Adams	5,602	890	24	10	2	6	1	807	73	26	6	4	2
Alexander	852	131	6	0	0	0	0	139	9	1	0	0	0
Bond	1,395	267	4	3	0	0	0	279	28	4	0	0	1
Boone	5,519	882	7	2	1	3	0	763	87	10	4	1	1
Brown	372	98	3	0	0	0	0	77	5	2	0	2	0
Bureau	3,026	399	3	2	2	0	1	371	57	9	1	0	0
Calhoun	384	66	2	0	0	0	0	58	7	1	0	0	1
Carroll	1,102	265	6	3	0	0	0	293	49	10	3	0	0
Cass	1,363	322	6	3	0	0	0	417	37	4	1	0	0
Champaign	15,924	1,997	12	2	3	0	0	2,372	108	13	3	1	3
Christian	2,787	534	1	0	0	1	0	660	46	10	4	1	0
Clark	1,374	301	5	1	0	1	0	286	15	3	1	0	0
Clay	1,162	282	5	0	0	0	0	271	30	2	1	2	0
Clinton	2,874	331	4	0	1	0	0	367	17	3	1	1	0
Coles	3,883	750	7	2	1	1	1	912	96	15	3	1	2
Cook w/o Chicago	233,930	39,332	267	74	54	40	11	48,446	4,756	252	75	41	67
Chicago	291,107	105,788	1,670	470	214	227	46	116,164	28,017	1,242	417	159	228
Crawford	1,335	269	2	0	1	0	0	285	16	1	1	0	0
Cumberland	876	159	0	0	0	0	0	159	15	3	1	2	0
DeKalb	8,861	647	5	1	0	0	0	842	65	4	2	0	2
DeWitt	1,441	290	5	1	2	2	0	311	37	3	1	0	3
Douglas	1,988	324	1	1	1	1	0	321	23	5	0	0	0
DuPage	85,809	5,971	17	7	2	2	0	7,364	412	21	5	4	5
Edgar	1,472	285	6	1	1	0	0	252	24	2	0	1	1
Edwards	529	158	1	0	0	0	0	123	8	0	0	0	0
Effingham	3,188	673	10	0	0	1	0	656	19	1	2	0	0
Fayette	1,749	413	4	0	0	1	0	427	30	6	1	1	1
Ford	1,244	68	0	1	0	0	0	75	8	1	0	0	0
Franklin	3,433	532	6	3	1	0	0	473	37	3	6	0	1
Fulton	2,761	431	12	5	4	2	0	391	48	9	2	2	0
Gallatin	445	155	0	0	0	0	0	147	3	2	0	0	0
Greene	1,136	311	1	1	1	0	0	337	18	4	1	1	0
Grundy	4,640	378	1	1	1	1	0	432	21	0	1	0	1
Hamilton	575	165	1	0	0	0	0	136	15	0	1	0	0



County	2007 Estimated Population of Children 6 Years and Younger	Total Tested	2007					Total Tested	2008				
			10- 14	15- 19	20- 24	25- 44	45+		5- 9	10- 14	15- 19	20- 24	25+
			µg/dL						µg/dL				
Hancock	1,417	401	3	1	0	2	0	428	71	4	4	0	0
Hardin	314	57	0	1	0	0	0	44	2	1	0	0	0
Henderson	455	112	1	1	0	0	0	112	12	1	4	0	0
Henry	3,902	925	16	8	0	1	0	892	110	12	4	0	1
Iroquois	2,428	297	5	2	1	0	0	348	28	9	7	0	0
Jackson	4,323	1,000	9	3	1	1	0	1,025	37	1	0	3	1
Jasper	805	150	1	0	0	0	0	126	7	2	0	0	0
Jefferson	3,292	574	1	2	0	1	0	574	29	4	1	2	0
Jersey	1,760	327	2	0	0	0	1	397	22	2	1	1	0
Jo Daviess	1,625	161	2	0	0	0	0	141	15	2	0	0	2
Johnson	966	84	0	0	0	0	0	109	4	0	0	0	0
Kane	62,323	11,278	167	49	20	22	6	12,415	1,185	166	61	30	42
Kankakee	10,924	2,521	28	10	6	2	0	3,182	259	58	22	7	12
Kendall	11,716	590	4	1	0	2	0	731	14	8	1	0	0
Knox	4,085	1,265	30	12	4	5	0	1,082	163	22	5	3	5
Lake	74,056	10,815	41	12	4	5	0	10,961	404	49	10	9	9
LaSalle	9,750	1,321	13	6	2	2	0	1,606	439	26	12	1	2
Lawrence	1,116	384	2	3	0	0	0	352	26	4	3	1	0
Lee	2,690	184	6	0	2	1	0	194	22	5	3	1	0
Livingston	3,479	765	24	1	0	2	0	790	149	17	4	0	1
Logan	2,257	352	3	1	1	0	0	421	28	5	1	0	0
McDonough	1,894	321	7	0	1	0	0	346	34	3	1	0	2
McHenry	32,351	2,709	11	5	2	5	0	2,439	124	12	2	4	0
McLean	15,168	2,060	13	5	2	0	1	2,411	214	21	9	5	1
Macon	9,466	3,193	104	27	7	8	0	2,932	300	66	24	10	20
Macoupin	3,932	599	5	0	1	1	0	706	41	12	5	0	1
Madison	23,589	2,836	19	8	2	3	0	3,401	258	43	8	5	10
Marion	3,438	707	5	1	1	1	0	793	63	7	3	3	1
Marshall	1,000	158	4	3	1	3	0	185	38	2	2	0	5
Mason	1,251	291	8	2	0	2	0	304	26	2	0	1	0
Massac	1,374	201	1	0	0	0	0	215	13	0	0	0	0
Menard	1,010	132	1	0	0	0	0	176	8	0	0	0	0
Mercer	1,296	331	8	2	0	2	0	370	57	5	3	1	1
Monroe	2,726	239	1	0	0	0	0	249	14	1	0	0	0
Montgomery	2,274	581	6	7	0	3	0	580	61	6	2	1	0
Morgan	2,805	596	10	5	0	2	0	659	60	6	1	0	5
Moultrie	1,284	123	1	0	0	0	0	104	7	0	2	0	0
Ogle	4,455	369	5	2	1	2	0	426	39	5	1	0	1
Peoria	17,966	3,382	100	53	15	7	0	3,154	626	96	34	11	10
Perry	1,729	367	2	1	0	0	0	400	28	1	1	0	1
Piatt	1,309	237	2	1	0	0	0	225	13	1	0	1	4
Pike	1,307	330	4	3	0	0	0	340	29	4	1	2	1



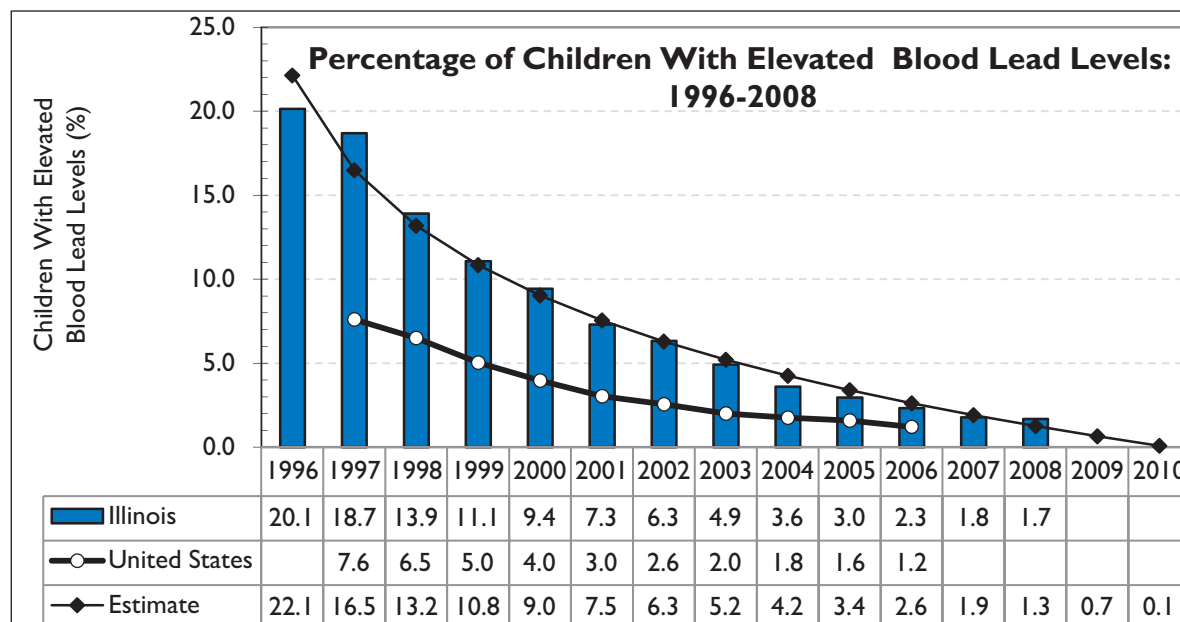
County	2007 Estimated Population of Children 6 Years and Younger	Total Tested	2007					Total Tested	2008				
			10-14	15- 19	20- 24	25- 44	45+		5- 9	10-14	15- 19	20- 24	25+
			µg/dL						µg/dL				
Pope	232	37	0	0	0	0	0	30	4	0	0	0	0
Pulaski	571	108	0	0	0	1	0	114	12	0	1	0	0
Putnam	426	64	1	0	0	0	0	72	13	1	0	0	1
Randolph	2,558	390	2	1	1	0	0	460	26	3	1	0	0
Richland	1,301	216	0	0	0	0	0	236	15	2	0	0	0
Rock island	13,571	4,589	81	28	13	14	4	4,329	579	70	24	11	13
St. Clair	25,877	6,849	87	25	7	10	1	7,582	678	100	29	10	9
Saline	2,171	746	3	2	3	4	0	758	55	4	4	1	0
Sangamon	17,676	2,918	39	15	5	4	2	3,505	293	71	16	9	6
Schuyler	529	51	3	0	0	0	1	126	23	2	0	0	0
Scott	399	96	1	0	1	0	0	118	10	4	0	0	1
Shelby	1,664	312	6	0	0	0	0	314	19	2	1	0	1
Stark	510	110	3	0	0	0	0	121	17	6	1	1	0
Stephenson	3,892	1,238	39	7	6	7	0	1,290	246	42	18	9	6
Tazewell	11,420	1,734	14	1	2	1	0	1,398	200	15	6	2	7
Union	1,542	328	1	1	1	0	0	447	31	2	1	1	1
Vermilion	7,416	1,677	41	16	6	4	0	1,313	144	20	8	7	3
Wabash	987	336	9	1	1	0	0	294	26	8	1	2	8
Warren	1,352	252	7	3	2	1	0	264	42	2	4	0	1
Washington	1,204	149	1	0	0	2	0	157	17	2	3	1	0
Wayne	1,326	428	2	0	0	0	0	435	22	1	0	0	0
White	1,206	342	4	1	1	1	0	351	26	4	0	0	0
Whiteside	5,124	1,300	9	2	2	2	2	1,387	116	10	10	1	10
Will	76,785	6,465	27	7	8	9	1	7,075	306	34	20	4	7
Williamson	5,443	642	5	4	0	0	0	678	39	5	2	2	0
Winnebago	28,432	5,124	79	20	18	16	2	4,196	517	54	26	8	21
Woodford	3,321	274	4	1	0	0	0	324	34	7	2	0	0
Unidentified		43,033	33	24	18	9	0	25,675	1,620	190	86	38	67
<b>Illinois Total</b>	<b>1,243,832</b>	<b>296,997</b>	<b>3,280</b>	<b>991</b>	<b>461</b>	<b>459</b>	<b>79</b>	<b>304,807</b>	<b>44,445</b>	<b>3,024</b>	<b>1,050</b>	<b>433</b>	<b>619</b>
<b>Minimum</b>	232	37	0	0	0	0	0	30	2	0	0	0	0
<b>Maximum</b>	291,107	105,788	1,670	470	214	227	46	116,164	28,017	1,242	417	159	228
<b>County Median</b>	2,171	360	5	1	1	1	0	399	31	4	1	1	1
<b>County Mean</b>	12,101	2,856	32	10	4	4	1	2,931	427	29	10	4	6

Source: Illinois Lead Program Surveillance Data, 2008, and Illinois Center for Health Statistics

The total number of children screened in the activity summary boxes and total tested column for 2007 and 2008 are the actual numbers reported to the Department. These numbers include children tested for the first time, as well as those being retested. Where a child has multiple tests, the highest venous result is selected. If there is no venous test, the highest capillary result is selected.

## Childhood Lead Poisoning Rate in Illinois and the United States by Year: 1996-2008

Figure 7



Source: Illinois Lead Program Surveillance Data, 2008

The United States average is based on the data reported by the Centers for Disease Control and Prevention (CDC) at: <http://www.cdc.gov/nceh/lead/data/national.htm>.

Despite the decline in lead poisoning rates, the percentage of Illinois children with elevated lead levels far exceeds the national estimate across the years (Figure 7). Illinois still leads the nation in the number of lead poisoned children. In 2008, approximately 5,126 children were identified in Illinois with elevated lead levels. According to 2006 data from CDC, 1.2 percent of children in the United States are lead poisoned.

### Mission

The mission of the Illinois Lead Program is to eliminate the incidence of childhood lead poisoning.

### Goal

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



## Lead Poisoning and Testing Rates of Children Younger Than 3 Years of Age in 2008

**Table 5.** Lead Poisoning and Testing Rates of Children Younger Than 3 Years of Age in 2008

County	Estimated 2007 Population of Children Younger than 3 Years of Age	Number of Children Tested (n)	Children with Elevated Lead Levels of 10 µg/dL and over (n)	Lead Poisoning Rate Based on Number of Children Tested (%)	Population of Children Tested (%)
Adams	2,466	518	26	5.0	21
Alexander	359	57	0	0.0	16
Bond	593	223	4	1.8	38
Boone	2,390	495	9	1.8	21
Brown	169	34	2	5.9	20
Bureau	1,247	167	4	2.4	13
Calhoun	175	44	2	4.5	25
Carroll	459	145	7	4.8	32
Cass	567	160	1	0.6	28
Champaign	7,094	1,762	13	0.7	25
Christian	1,182	495	9	1.8	42
Clark	604	201	4	2.0	33
Clay	476	195	3	1.5	41
Clinton	1,280	286	5	1.7	22
Coles	1,643	640	16	2.5	39
Cook (w/o Chicago)	99,113	24,921	233	0.9	25
Crawford	546	231	2	0.9	42
Cumberland	395	127	4	3.1	32
DeWitt	563	159	6	3.8	28
DeKalb	3,796	357	4	1.1	9
Douglas	830	220	3	1.4	27
DuPage	35,477	3,833	19	0.5	11
Edgar	662	135	2	1.5	20
Edwards	215	76	0	0.0	35
Effingham	1,366	296	2	0.7	22
Fayette	753	369	9	2.4	49
Ford	546	42	1	2.4	8
Franklin	1,439	219	2	0.9	15
Fulton	1,153	191	7	3.7	17
Gallatin	179	94	1	1.1	53
Greene	476	192	3	1.6	40
Grundy	2,077	202	1	0.5	10
Hamilton	226	82	1	1.2	36
Hancock	597	281	4	1.4	47
Hardin	136	23	0	0.0	17
Henderson	178	50	4	8.0	28
Henry	1,679	556	9	1.6	33





County	Estimated 2007 Population of Children Younger than 3 Years of Age	Number of Children Tested (n)	Children with Elevated Lead Levels of 10 µg/dL and over (n)	Lead Poisoning Rate Based on Number of Children Tested (%)	Population of Children Tested (%)
Iroquois	1,018	155	3	1.9	15
Jackson	1,908	780	3	0.4	41
Jasper	347	106	2	1.9	31
Jefferson	1,434	447	7	1.6	31
Jersey	759	307	4	1.3	40
Jo Daviess	657	67	2	3.0	10
Johnson	412	31	0	0.0	8
Kane	26,706	6,910	162	2.3	26
Kankakee	4,685	1,554	33	2.1	33
Kendall	5,180	367	7	1.9	7
Knox	1,719	712	17	2.4	41
LaSalle	4,107	785	24	3.1	19
Lake	30,710	5,188	32	0.6	17
Lawrence	468	245	3	1.2	52
Lee	1,169	97	4	4.1	8
Livingston	1,492	484	17	3.5	32
Logan	973	299	4	1.3	31
Macon	4,122	1,828	66	3.6	44
Macoupin	1,672	459	11	2.4	27
Madison	10,050	1,877	30	1.6	19
Marion	1,511	612	7	1.1	41
Marshall	430	84	7	8.3	20
Mason	512	181	2	1.1	35
Massac	593	62	0	0.0	10
McDonough	830	233	4	1.7	28
McHenry	13,513	1,257	10	0.8	9
McLean	6,643	1,725	18	1.0	26
Menard	415	137	0	0.0	33
Mercer	529	226	7	3.1	43
Monroe	1,136	181	1	0.5	16
Montgomery	949	441	6	1.4	46
Morgan	1,197	399	10	2.5	33
Moultrie	533	65	1	1.5	12
Ogle	1,887	205	6	2.9	11
Peoria	7,857	2,128	84	3.9	27
Perry	732	232	1	0.4	32
Piatt	573	143	1	0.7	25
Pike	559	260	6	2.3	47
Pope	108	9	0	0.0	8
Pulaski	249	56	0	0.0	22
Putnam	176	29	2	6.9	16



County	Estimated 2007 Population of Children Younger than 3 Years of Age	Number of Children Tested (n)	Children with Elevated Lead Levels of 10 µg/dL and over (n)	Lead Poisoning Rate Based on Number of Children Tested (%)	Population of Children Tested (%)
Randolph	1,080	332	1	0.3	31
Richland	554	178	2	1.1	32
Rock Island	5,977	2,354	68	2.9	39
Saline	930	414	5	1.2	45
Sangamon	7,545	2,183	62	2.8	29
Schuyler	209	67	2	3.0	32
Scott	166	73	3	4.1	44
Shelby	752	240	3	1.3	32
St. Clair	11,330	4,147	68	1.6	37
Stark	226	54	4	7.4	24
Stephenson	1,644	770	48	6.2	47
Tazewell	4,898	964	24	2.5	20
Union	676	212	2	0.9	31
Vermilion	3,190	626	18	2.9	20
Wabash	440	198	16	8.1	45
Warren	613	168	5	3.0	27
Washington	532	52	3	5.8	10
Wayne	544	262	0	0.0	48
White	519	227	3	1.3	44
Whiteside	2,183	902	27	3.0	41
Will	32,502	3,358	39	1.2	10
Williamson	2,315	272	0	0.0	12
Winnebago	12,231	2,700	67	2.5	22
Woodford	1,444	214	5	2.3	15
Unidentified		11,993	55	0.5	
Chicago*	130,069	56,585	1,170	2.1	44
<b>Illinois Total</b>	<b>406,126</b>	<b>158,986</b>	<b>2,726</b>	<b>1.7</b>	<b>39</b>
<b>Minimum</b>	<b>108</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>7</b>
<b>Maximum</b>	<b>99,113</b>	<b>24,921</b>	<b>233</b>	<b>8</b>	<b>53</b>
<b>County Median</b>	<b>880</b>	<b>232</b>	<b>4</b>	<b>2</b>	<b>28</b>
<b>Geometric Mean</b>	<b>1,153</b>	<b>287</b>	<b>5</b>	<b>1.8</b>	<b>24</b>

Source: Illinois Lead Program Surveillance Data, 2008 and Illinois Center for Health Statistics

\*city of Chicago only

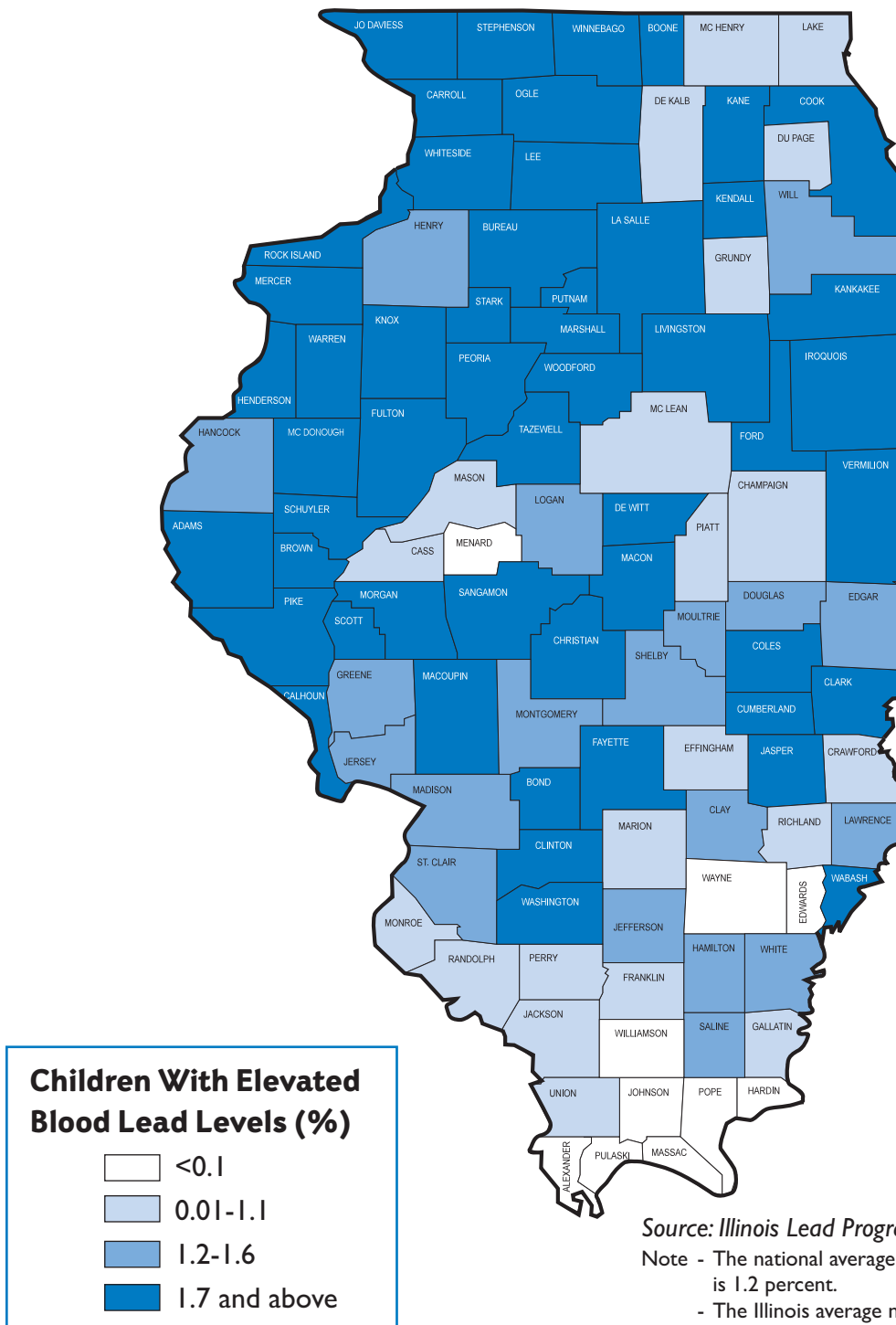
Table 5 above represents the percentage of Illinois children younger than 3 years of age with elevated blood lead levels by county based on number of children tested. In 2008, the lead poisoning rate of Illinois children younger than 3 years of age was 1.7 percent with a range of 0 to 8 based on 158,986 (39 percent) children tested. Fifty-four counties exhibited lead poisoning rates of 1.7 percent and above. The median testing rate by county was 28 percent.



Figure 8

### Illinois Department of Public Health

Percentage of Children Younger Than 3 Years of Age With Elevated Blood Lead Levels in 2008 by County Based on Number of Children Tested



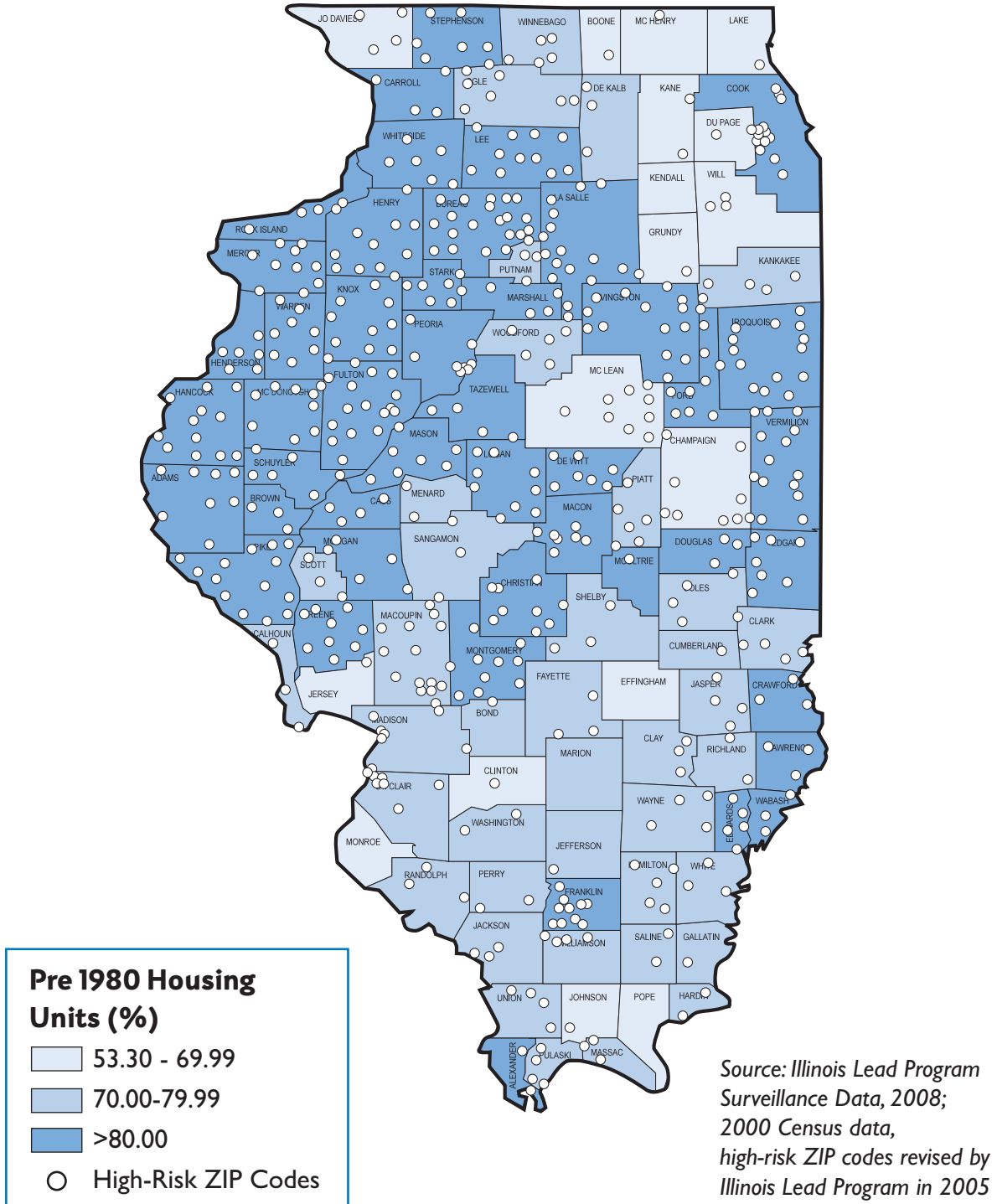
Source: Illinois Lead Program Surveillance Data, 2008  
 Note - The national average number of lead poisoned children is 1.2 percent.  
 - The Illinois average number of lead poisoned children was 1.7 percent in 2008.



Figure 9

## Illinois Department of Public Health

### Percentage of Children Living in Housing Units Built Before 1980 by County

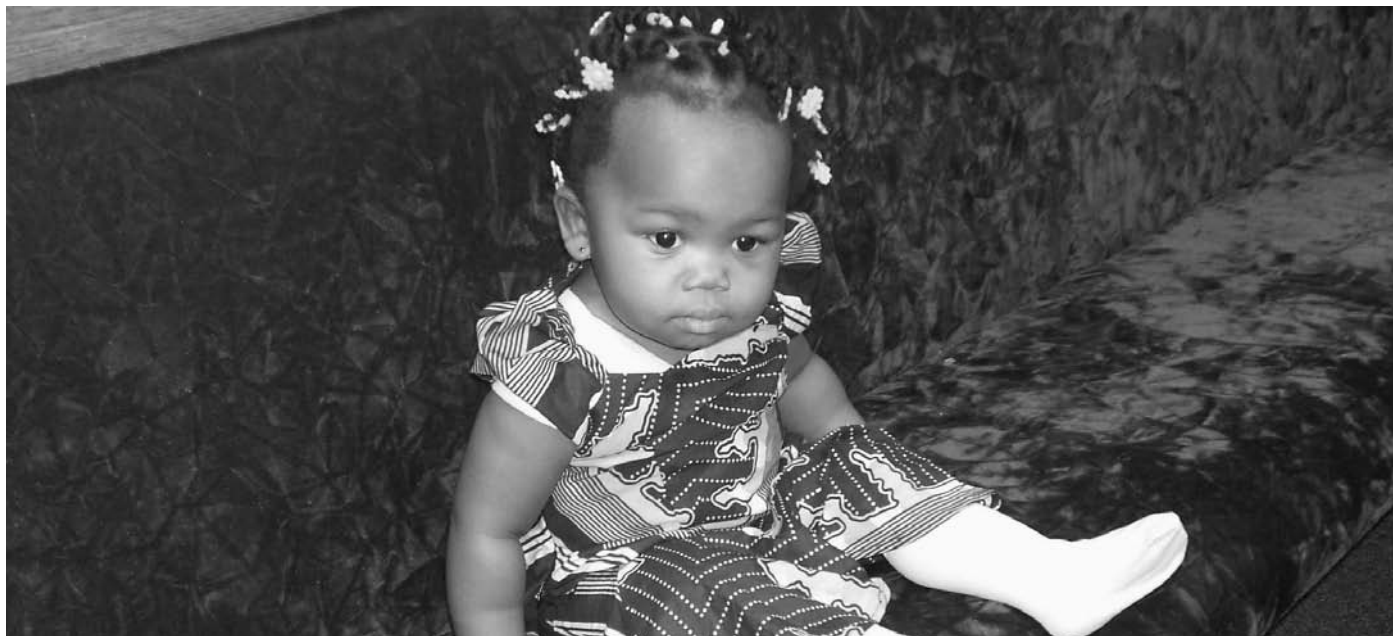


## Housing Units With Lead Hazards and Low-Income Residents

**Table 6.** Estimate of the Number of Housing Units in Illinois With Lead Hazards and Low-Income Residents

Age of Housing <sup>1</sup>	Illinois Estimate	Illinois (excluding Chicago) Estimate	% With Lead <sup>2</sup>	Illinois Units With Lead	Illinois (excluding Chicago)
Pre 1950	1,588,826	932,668	78%	1,239,284	727,481
Pre 1978	3,572,072	2,563,121	54%	1,928,919	1,384,085
Built 1970 to 1979	791,278	702,616	24%	189,907	168,628
Built 1960 to 1969	637,465	519,420	24%	152,992	124,661
Built 1950 to 1959	712,759	548,940	69%	491,804	378,769
Built 1940 to 1949	380,261	252,670	69%	262,380	174,342
Built 1939 or earlier	1,208,565	679,998	87%	1,051,452	591,598
Total # of Units	5,196,936	4,023,182			
Total Units with Lead				2,211,499	1,475,919
% Units with Lead				45%	40%
% Occupied				94%	95%
% Low Income				20%	20%

Source: Illinois Lead Program from U.S. Census Bureau, 2005-2007 American Community Survey (ACS) three-year estimate, 2National Survey of Lead and Allergens in Housing, Volume I: Analysis of Lead Hazards, FINAL REPORT, Revision 7.1, October 31, 2002.





## Lead Poisoning in Medicaid Children

### Blood Lead Screening Criteria for Medicaid-eligible Children

The following targeted screening criteria should be incorporated in all state plans. A Medicaid-eligible child who meets any one of the following criteria should receive a blood lead screening test:

- Child is suspected by a parent or a health-care provider to be at risk for lead exposure
- Child has a sibling or frequent playmate with elevated blood lead level
- Child is a recent immigrant, refugee, or foreign adoptee
- Child's parent or principal caregiver works professionally or recreationally with lead
- Child has a household member who uses traditional, folk, or ethnic remedies or cosmetics or who routinely eats food imported informally (e.g., by a family member) from abroad
- Child's family has been designated at increased risk for lead exposure by the health department because the family meets local risk factors for lead exposure (e.g., such as residence in a designated high-risk ZIP code or near a known point source)

Source: *MMWR August 7, 2009/58(RR09);1-11* as presented by Mary Jean Brown, Chief, Lead Poisoning Prevention Branch, Centers for Disease Control and Prevention

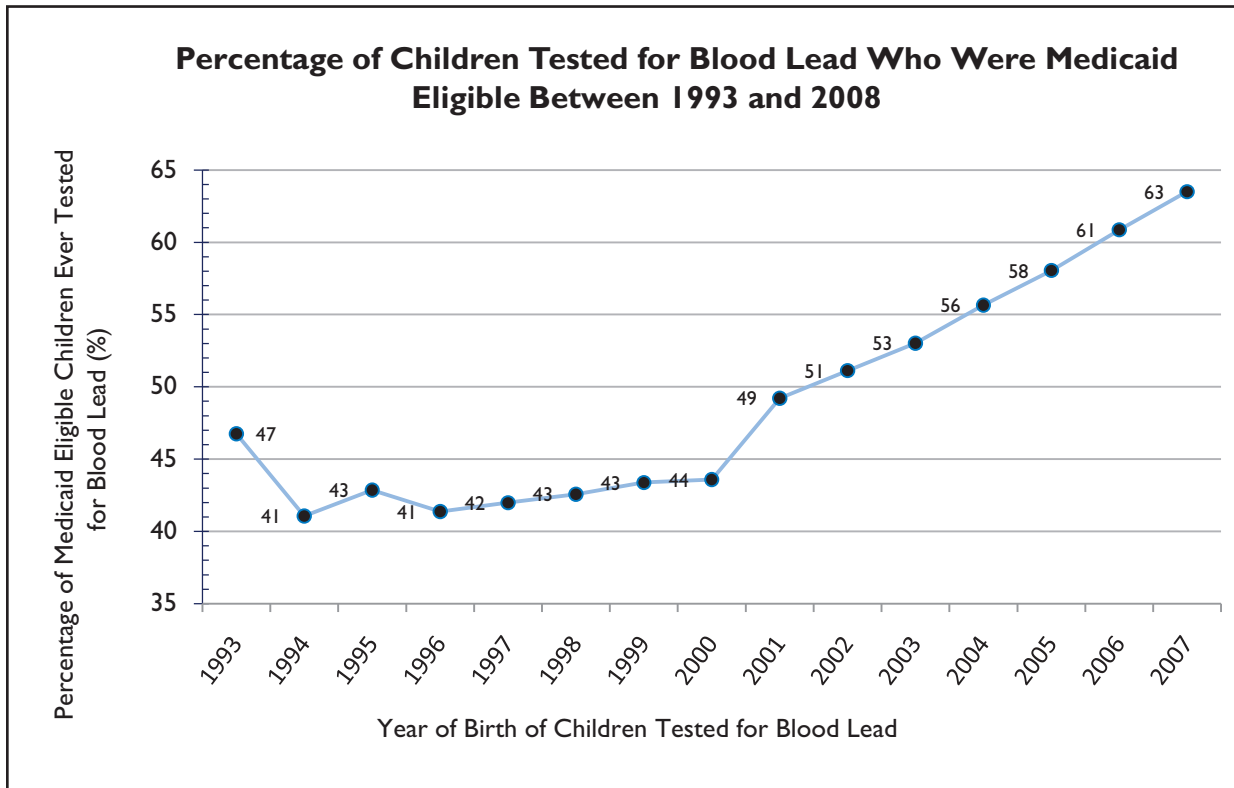
**Table 7.** Lead Poisoning Rates of Medicaid-enrolled Children 72 Months of Age or Younger by Age, Gender and RaceSource:

		Screening Rate (%)	Lead Poisoning Rate (%)
<b>Age in Months</b>	6 to 12	12.4	3.1
	6 to 24	37.9	2.8
	12 to 36	57.6	3.2
	12 to 72	66.4	4.2
<b>Gender</b>	Female	68.5	4.3
	Male	67.9	4.8
<b>Race</b>	African American	73.1	6.2
	American Indian/Alaskan Native	59.6	3.8
	Asian/Pacific Islander	55.2	1.9
	Caucasian	65.4	4.7
	Other	47.2	3.3
<b>Ethnicity</b>	Hispanics	75.1	3.6

During calendar year 2006, Illinois (excluding Chicago) had 344,106 children 72 months of age or younger who were enrolled in Illinois Department of Healthcare and Family Services medical programs (Medicaid). The percentage of total Medicaid enrolled children who were tested and found to have EBLs was 4.2 percent, a level that exceeds the national norm of 2.5 percent (Table 7).

Source: *Illinois Lead Program Surveillance Data, 1993-2008* and *Illinois Department of Healthcare and Family Services-Medical Data Warehouse*. Note: Screening rate = percentage of total enrolled Medicaid children tested for elevated blood lead levels. Lead poisoning rate = percentage of total enrolled Medicaid children tested with elevated blood lead levels.

Figure 10



Source: Illinois Lead Program Surveillance Data, 1993-2008

**Table 8.** Elevated Blood Lead Levels of Non-Medicaid and Medicaid-eligible Children 6 Years of Age and Younger in Illinois<sup>1</sup>

Age of children (Months)	Children Tested With Elevated Venous Blood Lead Levels $\geq 10\mu\text{g/dL}$ (%)	
	Medicaid	Non-Medicaid
6 to 36	4.1	3.7

Source: Illinois Childhood Lead Poisoning Prevention Program, 2008

<sup>1</sup>The Medicaid data used for this analysis was based on children 72 months of age or younger who were enrolled in Illinois Healthcare and Family Services medical programs between January and March 2006.



## Geographical Distribution of Lead Poisoned Children Identified in 2008

It is important to identify children with elevated blood lead levels to ensure appropriate medical follow-up and environmental investigation to minimize adverse effects and further exposure. Illinois law requires physicians to test all children ages 6 months through 6 years if they reside in a high-risk area, or use the lead risk assessment questionnaire to assess children if they reside in a low-risk area.

The Illinois Department of Public Health has regional offices in six geographical regions. Each regional office has environmental specialists who conduct home inspections for lead poisoned children with lead levels of 10 micrograms per deciliter or above.

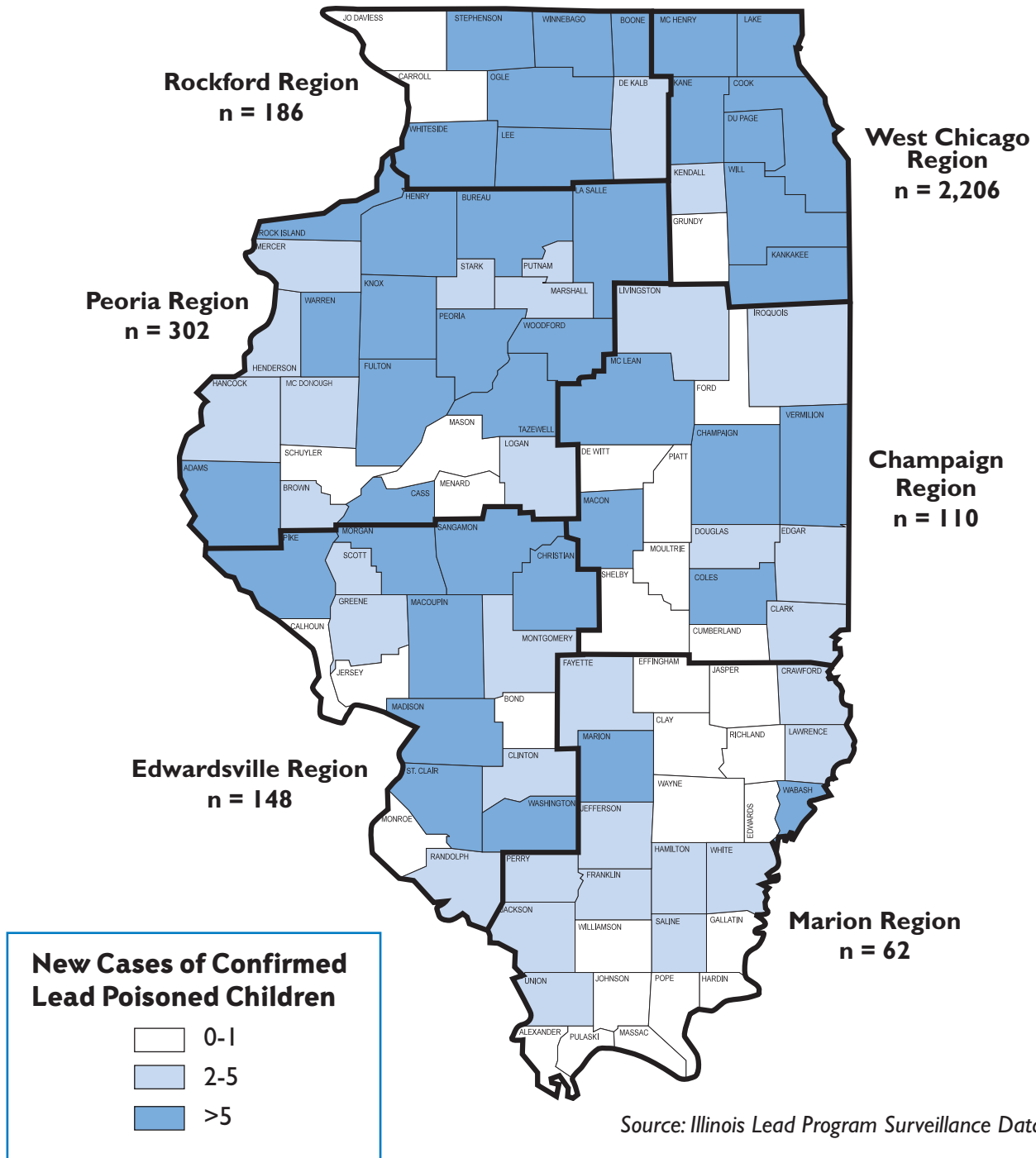






Figure 11

**Illinois Department of Public Health**  
**Geographic Regions of the Illinois Department of Public Health**  
 Confirmed (venous) Cases of Lead Poisoned Children Identified in 2008





## Case Management of Lead Poisoned Children

The Illinois Department of Public Health has grant agreements with 87 delegate agencies to provide case management care for lead poisoned children in 91 of 102 counties. Children with confirmed venous elevated blood lead levels of 10 micrograms per deciliter or higher are provided comprehensive case management. For children younger than 36 months of age, with confirmed venous levels of 10  $\mu\text{g}/\text{dL}$  and above and children older than 36 months of age with levels of 20  $\mu\text{g}/\text{dL}$  and above, public health nurses conduct home visits to educate families on ways to lower the blood lead level, including proper nutrition, hygiene and housekeeping. Home visits include a visual assessment of the residence to include education on other hazards in the home that could result in negative health effects.

Case management activities include education, nurse home visits, and referrals for related services such as medical, nutritional supplementation and developmental testing. In collaboration with the Department, these delegate agencies provide community education and technical information to health care providers, families of lead poisoned children and the general public. Each of the delegate agencies uses the STELLAR (Systematic Tracking of Elevated Lead Levels and Remediation) data processing system to maintain records for case management of children in the delegate agency's jurisdiction.

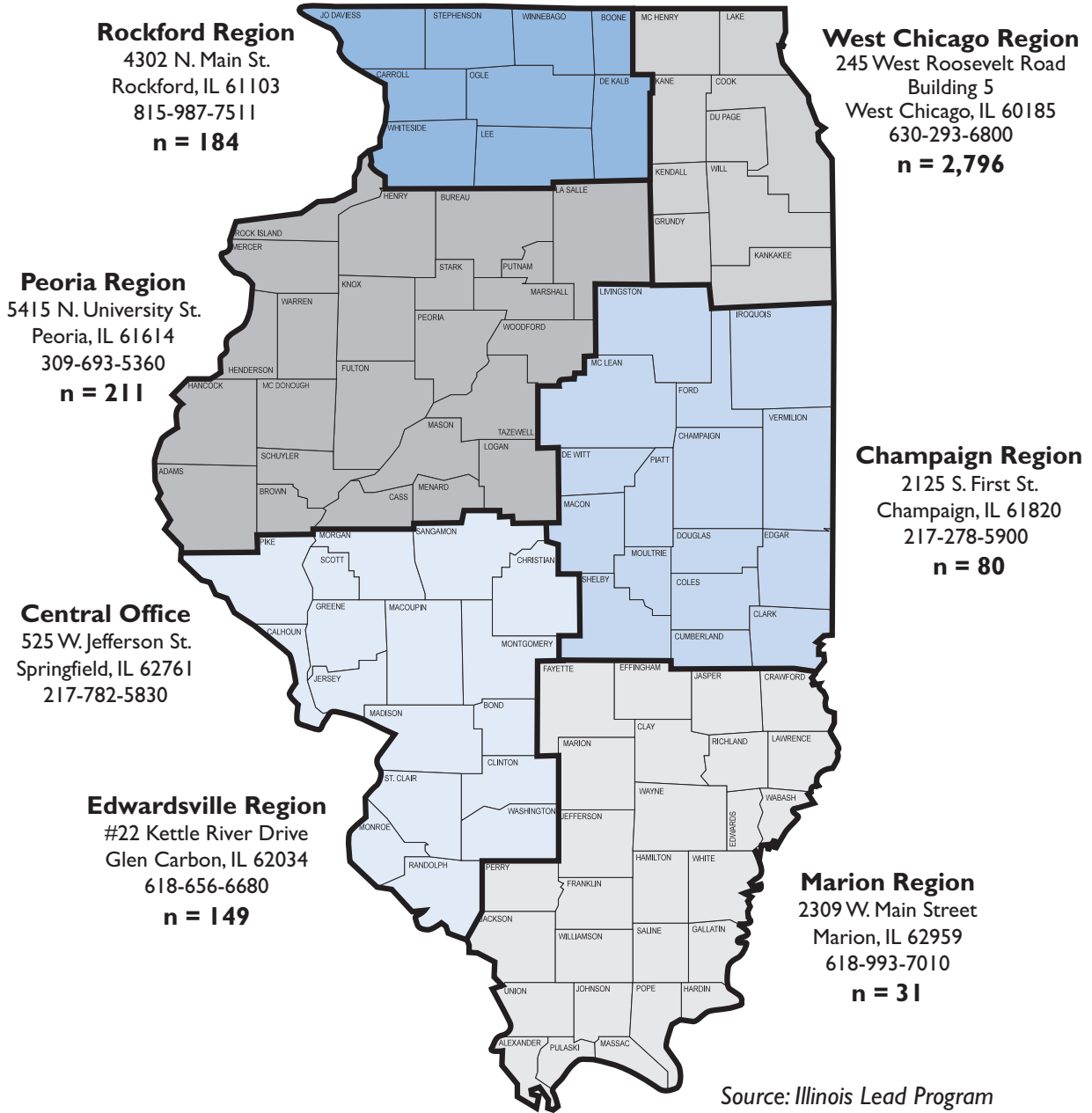
Local health departments without a delegate agency agreement are designated as non-delegate agencies. There are currently 10 non-delegate agencies where case management is provided by the Illinois Lead Program regional nurse consultants.

The Illinois Lead Program, its delegate agencies, and local health departments provided follow-up medical case management services to 3,451 confirmed new and existing cases of lead poisoned children in 2008. Most of the cases of lead poisoned children reside in the West Chicago Region (Figures 11 and 12). About 80 percent of the housing units in the West Chicago Region were built before 1980 (Figure 9). Additionally, more than 20 percent of children in the West Chicago Region live below poverty level (Figure 11). All ZIP codes in the Chicago region are classified as high-risk areas for pediatric blood lead poisoning. The Marion Region, with the least number of lead poisoned cases, has more than 20 percent of children living below poverty level.



Figure 12

**Illinois Department of Public Health**  
**Geographic Regions of the Illinois Department of Public Health**  
 Number of Lead Poisoned Cases Managed  
 by Department and Delegate Agency Staff in 2008



Source: Illinois Lead Program Surveillance Data, 2008  
 Note: Eighty-six delegated agencies and two regional nurse consultants provide medical case management services



## Environmental Investigation and Follow-up of Lead Poisoned Children

The Illinois Department of Public Health has grant agreements with 18 delegate agencies to provide environmental inspection services in addition to case management services. Environmental services include home inspections and risk assessment in addition to the case management services. Remediation is required by law when a lead hazard has been identified in a home where a lead poisoned child lives or regularly visits. Local health departments not covered by a delegate agency agreement are served by the Illinois Lead Program regional environmental health specialists housed in the regional offices of the Illinois Department of Public Health.

Environmental remediation is a high priority because medical treatment is ineffective when the child returns to a harmful environment. Homes of children who exhibit elevated blood lead levels are inspected and a report of existing lead hazards is provided. Safe work and cleanup procedures are provided as all identified hazards are required to be controlled or eliminated.

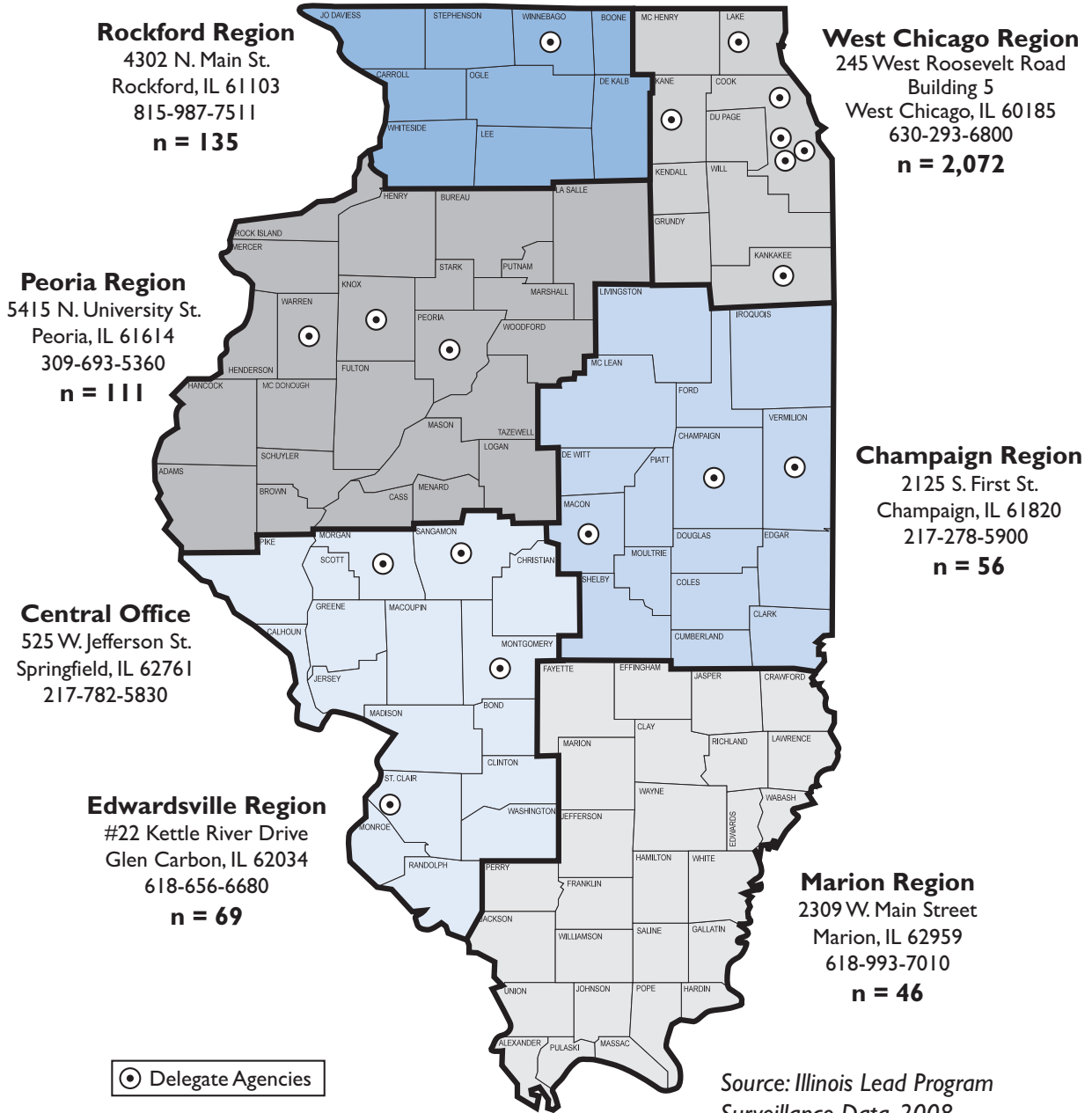
In accordance with the Illinois Lead Poisoning Prevention Act, 2,489 inspections were initiated at dwellings and common play areas of children with elevated blood lead levels of 10 micrograms per deciliter or higher. In 2006, of all the children aged 36 months and younger tested in Illinois, 4.1 percent of Medicaid-eligible children had elevated blood lead levels compared to 3.7 non-Medicaid children (Table 8).





Figure 13

**Illinois Department of Public Health**  
**Geographic Regions of the Illinois Department of Public Health**  
 Number of Initial Environmental Investigations of Lead Poisoning  
 by Department and Delegate Agency Staff in 2008



Source: Illinois Lead Program Surveillance Data, 2008  
 Note: Regional offices provide nurse consultations and environmental investigations  
 Eighteen delegate agencies also provide environmental inspection services



## Lead Poisoning Prevention Activities

### Primary Prevention

- Avoid exposure to lead
- Identify sources of lead poisoning like houses with lead based paint
- Focus on high-risk indicators (housing units with lead, low-income and minorities)
- Fix the highest risk housing
- Evaluate the hazards
- Control hazards
- Educate

### Secondary Prevention

- Early detection and intervention prevents the progression and emergence of lead poisoning symptoms
- Increase testing rates
- Intervene to reduce the risk of long-term damage
- Encourage home visits by public health nurse for case management
- Initiate environmental inspections for lead poisoned cases

### Tertiary Prevention

- Damages caused by lead poisoning are irreversible.
- Chelate or use chemical compounds that bind to lead to remove the toxic metal from the body
- Aim at improving the quality of life of lead poisoned children through education
- Eat foods rich in iron and calcium

### Educational Activities to Prevent Lead Poisoning in Illinois

The Illinois Lead Program conducted one-day lead poisoning prevention training sessions at all six regional offices of the Illinois Department of Public Health. All lead training sessions were held from 8:30 a.m. - 3:30 p.m. A total of 53 health care professionals were trained on lead poisoning in 2008. Topics covered in the training included:

- Lead poisoning case follow-up
- Health effects and treatment of lead poisoning
- Specimen handling and analysis at the Department's Division of Laboratories
- STELLAR – Systematic Tracking of Elevated Lead Levels and Remediation
- Compliance investigations by the Illinois Department of Public Health
- Environmental case follow-up for lead poisoned children
- Healthy homes initiatives



**Table 9.** Lead Educational Handouts Containing Lead Poisoning Prevention Information Distributed During Calendar Year 2008

Handouts	Number	Recipient
<b>Educational brochures</b>	70,708 total 15,159 in Spanish 175 in French 55,374 in English	Local health departments, health care providers, general public
<b>Promotional items</b>	10,614	Conferences, health fairs, training sessions, Illinois State Fair
<b>Curriculum sets</b>	38	Teachers
<b>Lead risk exposure fact sheets</b>	40,000	General public

Source: Illinois Lead Program Surveillance Data, 2008

### Educational Brochures

Education and detection are keys to lead poisoning prevention. Table 9 represents the distribution of educational materials regarding lead poisoning by the Department of Public Health. Promotional items are provided to delegate agencies for health fairs and lead screening promotions.

*Lead Screening and Case Follow-Up Guidelines for Local Health Departments* are available to local health departments that have a contractual agreement for case management of children in their jurisdiction with elevated blood lead levels. Additionally, *Preventing and Screening for Childhood Lead Poisoning – A Reference Guide for Physicians and Health Care Providers* is available to all physicians and health care providers who medically manage Illinois children with elevated blood lead levels.

Approximately 40,000 fact sheets on the risk of lead exposure were distributed by the Illinois Department of Human Services during a monthly billing period to families through daycare providers funded by the Illinois Childcare Assistance Program. A Spanish version also is available for download on the Department's Web site.

The Illinois Department of Public Health Web site, [www.idph.state.il.us](http://www.idph.state.il.us), is regularly updated for easy access to the educational materials by the general public. The Illinois Lead Poisoning Prevention Act, Lead Poisoning Prevention Code, the Strategic Plan for the Elimination of Lead Poisoning, Annual Surveillance Reports, 20 educational brochures and handouts, and 17 lead program forms are accessible for viewing and/or downloading.



## Lead Poisoning Prevention Internet Resources From the Illinois Department of Public Health Web Site

### **Illinois Lead Poisoning Prevention Act**

<http://www.ilga.gov/legislation/ilcs/ilcs2.asp?ChapterID=35>  
(go to 410 ILCS 45 - Lead Poisoning Prevention Act)

### **Administrative Code**

[www.ilga.gov/commission/jcar/admincode/077/07700845sections.html](http://www.ilga.gov/commission/jcar/admincode/077/07700845sections.html)  
[www.ilga.gov/commission/jcar/admincode/077/07700665sections.html](http://www.ilga.gov/commission/jcar/admincode/077/07700665sections.html)

### **Childhood Lead Risk Assessment Questionnaire and Guidelines**

[www.idph.state.il.us/envhealth/leadforms.htm](http://www.idph.state.il.us/envhealth/leadforms.htm)

This document also includes **Guidelines for Lead Risk Assessment Questionnaire** as the second page and the high-risk ZIP code list as the third page.

### **Pediatric High-Risk ZIP Code Areas**

[www.idph.state.il.us/HealthWellness/LeadHighRiskZIPcodes04.pdf](http://www.idph.state.il.us/HealthWellness/LeadHighRiskZIPcodes04.pdf)

### **Child Health Certificate of Examination**

[www.ilga.gov/commission/jcar/admincode/077/07700665sections.html](http://www.ilga.gov/commission/jcar/admincode/077/07700665sections.html) (law)  
[www.idph.state.il.us/pdf/cert\\_child\\_health05.pdf](http://www.idph.state.il.us/pdf/cert_child_health05.pdf) (English)  
[www.idph.state.il.us/pdf/officialpxS05.pdf](http://www.idph.state.il.us/pdf/officialpxS05.pdf) (Spanish)

### **Educational Brochures Order Form**

[www.idph.state.il.us/envhealth/pdf/Lead\\_Pub\\_Order\\_Form.pdf](http://www.idph.state.il.us/envhealth/pdf/Lead_Pub_Order_Form.pdf)





## VIEWPOINT: Lead Levels Below 10 Microgram per Deciliter: Is it Harmful?

By

*Ashwin Korri: Graduate Public Service Intern from the University of Illinois at Springfield*

The U.S. Centers for Disease Control and Prevention has set screening levels for lead poisoning as a guideline for health departments and health practitioners since 1970. There has been a gradual reduction of this level based on new evidence from time to time. In 1990, the lead level of concern was set at 40 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ), in 1975 it was lowered to 30  $\mu\text{g}/\text{dL}$ , and it fell to 25  $\mu\text{g}/\text{dL}$  in 1985 before settling down at the current 10  $\mu\text{g}/\text{dL}$  in 1991. No action is initiated currently for blood lead levels (BLL) less than 10  $\mu\text{g}/\text{dL}$ . Therefore, anything below the level of 10  $\mu\text{g}/\text{dL}$  is considered acceptable. However, there have been debates about what concentration of blood lead should be considered acceptable/safe. When the initial screening BLL of 10  $\mu\text{g}/\text{dL}$  was initiated by CDC, it was pointed out that not enough evidence was available for levels under 10  $\mu\text{g}/\text{dL}$  and further research needs to be done.

New research published in various journals suggests that lead, even in small concentrations, is detrimental to the intellectual capacity of the affected children. In articles where IQ was the outcome measure, it was found that blood lead concentration was inversely related to IQ even when the average lifetime levels never exceed 10  $\mu\text{g}/\text{dL}$  (Lanphear et al., 2005). In fact, the variation in IQ is higher at lower levels than it is in higher levels of BLL. One study points out that average IQ declined by 7.4 points as average lifetime blood level concentrations increased from 1 to 10  $\mu\text{g}/\text{dL}$  (Canfield et al., 2003). While the numbers are not the same in all the studies, most of them give us a general sense that with an increase in each microgram per deciliter of lead in blood there is significant reduction of intellectual capacity, even when the levels are under 10  $\mu\text{g}/\text{dL}$ . Some research suggests that the intervention levels should possibly be lowered, which is being considered and under review by CDC.

It is noteworthy that some states, local health departments and even the city of Chicago have already lowered their action level for intervention to 5 micrograms per deciliter.

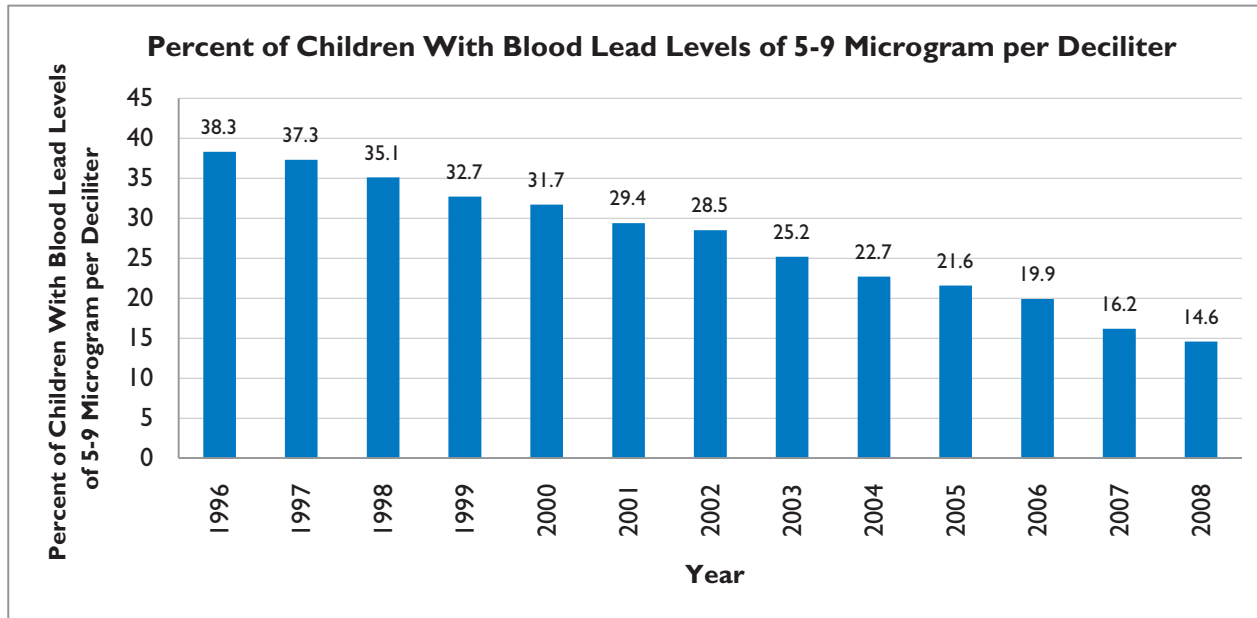
There is also another view that across-the-board lowering of intervention level is not warranted, based on current data on health risks and intervention options. At the same time, it is suggested that a number of changes in approach and implementation of the 1997 guidance is required (Susan M. Bernard, 2003).

In Illinois there are 44,445 children with blood lead levels between 5  $\mu\text{g}/\text{dL}$  and 9  $\mu\text{g}/\text{dL}$  who do not receive any intervention. If 5  $\mu\text{g}/\text{dL}$  is considered as a base line, it amounts to 14.6 percent of the total number of elevated blood lead records. Though this number has been declining over the years, it is still significant.

While the jury is still out on this issue, I cannot help but think about the old principle of "erring on the side of public health." With at least some evidence pointing to the adverse affects of lead under 10  $\mu\text{g}/\text{dL}$ , it may be time to start intervention at a level of 5  $\mu\text{g}/\text{dL}$ .



Figure 14



Source: Illinois Lead Program Surveillance Data, 1996-2008

## References

- Canfield, L. Richard; Henderson, R. Charles; Cory-Slechta, A. Deborah Jr., et al. (2003) Intellectual Impairment in Children With Blood Lead Concentrations Below 10  $\mu\text{g}$  per deciliter. *The New England Journal of Medicine* 348(16), 1517-1526
- Lanphear, P. Bruce; Hornung, Richard; Khoury, Jane; et al. (2005) Low-Level Environmental Lead Exposure and Children's Intellectual Function: An International Pooled Analysis. *Environmental Health Perspectives* 113 (7), 894-899
- Bernard, M. Susan; (2003) Should the Centers for Disease Control and Prevention's Childhood Lead Poisoning Intervention Level be Lowered? *American Journal of Public Health* 93 (8), 1253-1260



## RRP RULE: Renovation, Repair and Painting Rule

Common renovation activities like sanding, cutting, and demolition can create hazardous lead dust and chips by disturbing lead-based paint, which can be harmful to adults and children.

To protect against this risk, on April 22, 2008, the United States Environmental Protection Agency (U.S. EPA) issued a rule requiring the use of lead-safe practices and other actions aimed at preventing lead poisoning. Under the rule, beginning in April 2010, contractors performing renovation, repair and painting projects that disturb lead-based paint in homes, child care facilities, and schools built before 1978 must be certified and must follow specific work practices to prevent lead contamination.

The Illinois Lead Program is currently reviewing the requirements for becoming authorized by the EPA to carry out this rule. Currently, the Illinois Lead Program licenses approximately 2,500 individuals and companies involved in lead paint related activities. The RRP rule will require the licensure of more than 50,000 individuals and firms that are involved in the renovation of regulated pre-1978 structures. It appears that additional legislation may be required in order to meet the EPA requirements for authorization.

Until that time, EPA recommends that anyone performing renovation, repair, and painting projects that disturb lead-based paint in pre-1978 homes, child care facilities and schools follow lead-safe work practices such as containing the work area, minimizing dust, and thoroughly cleaning the area when the work is completed.

For more information on the RRP rule, visit the National Lead Information Center at [www.epa.gov/lead](http://www.epa.gov/lead) or by phone at 800-424-LEAD (5323).





## Healthy Homes Activities

The Illinois Lead program is committed to the Healthy People goal of eliminating elevated levels of lead in children. In addition to lead poisoning prevention activities, the program is also focusing on healthy homes activities, a more holistic approach to preventing diseases and injuries resulting from housing-related hazards.

### The Seven Principles Fundamental to Healthy Homes

1. Keep it dry
2. Keep it clean
3. Keep it ventilated
4. Keep it contaminant free
5. Keep it pest free
6. Keep it safe
7. Keep it well maintained

*Source: National Center for Healthy Housing*

The purpose of Healthy Homes Surveillance, according to the Centers for Disease Control and Prevention (CDC), is to:

- Identify and track housing-related risk factors and outcomes
- Generate research questions related to housing and health
- Generate intervention strategies related to housing and health
- Evaluate the long-term effectiveness of these strategies

According to CDC, childhood lead poisoning, injuries, respiratory diseases such as asthma, and quality of life issues have been linked to the more than 6 million substandard housing units nationwide.

**Nurse Home Visits for Case Management:** The Illinois Lead Program, its delegate agencies and local health departments provided follow-up medical case management services to 3,451 confirmed new and existing cases of lead poisoned children in 2008. Public health nurses conducted home visits to educate the affected families on ways to lower the blood lead level, including proper nutrition, hygiene, and housekeeping. Home visits included a visual assessment of the residence to include education on other hazards in the home that could result in negative health effects.

**Environmental Investigation:** A total of 2,489 inspections were initiated at dwellings and common play areas of children younger than 3 years of age with lead levels of 10 micrograms per deciliter or higher in order to determine the source of lead poisoning. The inspection is performed by environmental health specialists residing at regional offices of the Illinois Department of Public Health or staff at delegate agency with environmental contracts. Environmental inspections include X-ray fluorescence testing, dust wipe sampling, paint chip sampling, soil sampling, and water sampling.



**Illinois Regional Lead Training Sessions Includes Healthy Home Sessions:** During the calendar year 2008, the Illinois Lead Program at the Illinois Department of Public Health conducted lead training sessions at each of the Department's six Environmental Health Regions that included sessions addressing potential risk factors and housing hazards in the homes.

**Table 10.** Adverse Health Outcomes Related to Home Hazards

Home Hazard <sup>a</sup>	Priority Sources of Hazard	Some Adverse Priority Health Outcomes
Lead	Chipping leaded-paint, folk remedies with lead	Lead poisoning
Poor indoor air quality	Allergens and endotoxins, smoking inside home	Respiratory diseases like asthma, COPD, allergies, fungal infections; smoke inhalation, viral infections
Mold	Water leaks, moisture, poor ventilation	
Pets, pests and pesticides	Cockroaches, dust mites, signs of rodents	
Carbon monoxide	Fuel combustion products from unvented furnaces, stoves, heaters	Carbon monoxide poisoning, coma, neurological damage, death
Radon	Ventilation problems, compromised foundation	Lung cancer
Injury hazards	Loose rugs, accidental poisonings, unattached baby gates, choking, strangulation and firearms	Falls, injuries and death

Sources: U.S. Centers for Disease Control and Prevention (<http://www.cdc.gov/healthyhomes/>); National Center for Healthy Housing; <sup>a</sup> The list will be updated in subsequent reports.

**Indoor Air Quality:** Current research has linked poor indoor air quality to increased asthma exacerbation. Asthma is a chronic lung disease that leads to narrowing of the airways. Asthma is not curable but it can be controlled. Asthma is the leading cause of school absenteeism and hospitalization of children. According to the 2002 Illinois Behavioral Risk Factor Surveillance System, about 14 percent of households in Illinois had a child suffering from asthma and two-thirds of those children still have asthma. According to the key findings in the Burden of Asthma in Illinois report: children younger than 4 years of age had the highest hospitalization rate of 27.5 per 10,000. The cause of asthma is unknown. By observing the seven principles of healthy housing the asthma triggers can be minimized.

For more information on the burden of asthma in Illinois read "Burden of Asthma in Illinois 2000-2007, Illinois Department of Public Health" at: <http://www.idph.state.il.us/about/chronic/ILAsthmaBurdenReport2009.pdf>

**Mold:** Mold is a living organism or fungus that needs moisture and humidity to grow. Mold can cause allergic reactions, exacerbate asthma, and cause other respiratory illnesses. Some people are more allergic to mold than others. Mold can grow anywhere in the home.

- Control sources of moisture: fix water leaks and dampness.
- Reduce indoor humidity: vent bathrooms, use air conditioners, and de-humidifiers; use exhaust fans when cooking, dishwashing and cleaning.



- Clean wet surfaces to prevent mold growth.
- Prevent condensation of pipes, windows, ceilings and walls by adding insulation.
- Do not use carpets in high moisture areas.

Additional information about radon levels are available through.

<http://www.idph.state.il.us/envhealth/factsheets/mold.htm>

<http://www.idph.state.il.us/envhealth/factsheets/moisture.htm>

<http://www.epa.gov/iaq/molds/moldresources.html>

**Carbon Monoxide:** Carbon monoxide is a colorless, odorless, poisonous gas caused by incomplete combustion of oil, coal and wood. It can cause poisoning or death when inhaled. In homes, carbon monoxide poisoning results from faulty heating systems, inadequate ventilation, and improper use of portable gasoline powered generators. Illinois Public Act 94-741 mandates that every dwelling unit in Illinois must be equipped with at least one carbon monoxide alarm within 15 feet of every room used for sleeping purposes.

Tips from the Department to prevent carbon monoxide poisoning in your home:

- Check gas appliance periodically for proper operation and venting.
- Make sure flues, chimneys and vents are clear of debris and in good working order.
- Install carbon monoxide monitors and check them regularly to make sure they are working properly.
- Do not use unvented space heaters, gas stoves, or charcoal grills inside the home or in an attached garage.
- Check the exhaust system of your car regularly and keep it in good condition.
- Do not run the car or other gasoline-powered engines in a garage, even with the doors open.

Additional information about carbon monoxide poisoning in Illinois may be available through:

<http://www.idph.state.il.us/public/hb/hbcarbon.htm>

<http://www.yourillinoishome.com/legal/carbon.htm>

**Radon:** Radon, a radioactive gas, is the second leading cause of lung cancer. Radon seeps into homes through cracks in the basement floor or foundation. The U.S. EPA estimates that the risk of developing lung cancer at 4.0pCi/L is estimated at about seven lung cancer deaths per 1,000 persons. According to CDC, radon is the top cause of lung cancer among non-smokers in the country, leading to approximately 21,000 deaths each year.

Additional information about radon levels in Illinois may be available through:

Illinois Indoor Radon Program Web site

*Guidelines for Radon Measurements in the Home*

<http://www.state.il.us/iema/radon/radon.htm>



For additional resources on healthy homes, visit:

U.S. Centers for Disease Control and Prevention  
<http://www.cdc.gov/healthyplaces/newhealthyhomes.htm>

U.S. Environmental Protection Agency  
[www.epa.gov](http://www.epa.gov)

Housing and Urban Development  
[www.hud.gov](http://www.hud.gov)





## Illinois Lead Elimination Advisory Council

The Illinois Department of Public Health created the Illinois Childhood Lead Poisoning Elimination Advisory Council in 2003 to develop a five-year strategic plan for decreasing the serious threat posed by lead poisoning in children in the state. The council, like the Department, is dedicated to the reduction of exposures to lead for all Illinois children and to the achievement of the Healthy People 2010 goal of eliminating blood lead levels at or above 10 microgram per deciliter. The mission of the advisory council is to implement a comprehensive statewide strategic plan and foster creative partnerships. Nine major goals of the council are to:

- Improve awareness of childhood lead poisoning among parents, health care providers, the housing industry, elected officials and opinion leaders.
- Make lead-safe housing a priority in all areas of the state.
- Provide a mechanism to allow the public to make lead-safe housing choices.
- Be more aggressive in interventions against unsafe housing.
- Improve regulatory tools and compliance efforts against housing containing lead.
- Simplify and improve screening practices for at-risk children.
- Focus screening efforts in areas of highest concern.
- Identify children in rural areas at risk for lead poisoning.
- Provide better data analysis and an effective framework for the evaluation of long-term and short-term outcomes for the implementation of this strategic plan.

The advisory council meets quarterly. The meeting is held in a central location in Bloomington, Illinois. The council is divided into subcommittees who identify or address goals and objectives related to the elimination of childhood lead poisoning: education awareness; evaluation, primary prevention, resources, and screening plan. Each committee has a facilitator who reports the progress made towards the completion of the goals and activities during meetings.

The advisory council is composed of a diverse network of dedicated professionals, community activists, and other interested parties.

For more information on the Childhood Lead Poisoning Elimination Advisory Council and the Illinois Strategic Plan for the Elimination of Childhood Lead Poisoning, contact the Illinois Department of Public Health.



## Contact Information

Illinois Department of Public Health Illinois Lead Program

525 West Jefferson Street

Springfield, Illinois 62761

Telephone: 866-909-3572 or 217-782-3517

The hearing impaired can dial 800-547-0466

Web site: <http://www.idph.state.il.us/envhealth/ehpublications.htm#lead>

U.S. Centers for Disease Control and Prevention (CDC)

Web site: <http://www.cdc.gov/lead/>

National Lead Information Center

Telephone: 800-424-LEAD (5323)

Web site: [www.epa.gov/lead](http://www.epa.gov/lead)

National Center for Healthy Housing

Web site: <http://www.centerforhealthyhousing.org/>



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