

Tracking Exposures Through Louisiana’s Adult Blood Lead Epidemiology Surveillance (ABLES), 2012-2016

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Background

Lead has no beneficial use in the body, and its toxic effects are well documented. Lead affects many organ systems over a wide range of dose levels. Chronic lead exposure in adults may result in adverse effects in neurological, hematological, renal, cardiovascular, gastrointestinal, and reproductive systems. There is wide variability among individuals in the symptoms and responses to lead poisoning.

Lead poisoning usually occurs from chronic exposure. The degree and severity of effects depend on the dose and duration of exposure. Symptoms differ among individuals and do not always occur at specific dose levels. Reported symptoms of lead poisoning in adults include: headache; anorexia; weakness; excessive tiredness; irritability; difficulty concentrating; constipation; abdominal discomfort; fine tremors; reduced sex drive; and weakness in fingers, wrists, or ankles. However, lead poisoning is often a “silent disease” where symptoms are not observed until serious damage has occurred. Diagnosis should not rely on the appearance of symptoms. The only way to determine lead poisoning is by testing for lead levels in blood.

The Occupational Safety and Health Administration (OSHA) requires companies to have a biomonitoring and medical surveillance program when workers are exposed to airborne inorganic lead levels greater than the 30 micrograms per cubic meter (time-weighted average) more than 30 days in a year. Exposed workers are to be tested at least every six months, and testing frequency increases to every two months when a worker’s blood lead level is greater than 40 µg/dL. Louisiana law requires that healthcare providers, including clinical laboratories, report all laboratory tests for lead, mercury, cadmium, arsenic and carbon monoxide to the Louisiana Department of Health (LDH), Office of Public Health (OPH), Section of Environmental Epidemiology and Toxicology (SEET). SEET participates in the Centers for Disease Control’s Adult Blood Lead Epidemiology Surveillance (ABLES) Program, which determines the action threshold at which blood lead test results for adults ages 16 years and older are investigated to determine the source of exposure. Although in July 2015, ABLES reduced the lead action threshold from 25 micrograms per deciliter (µg/dL) to 10 µg/dL, an elevated lead test is still defined as greater or equal to 25 µg/dL for this report.

Results and Discussion

At least 80% of the tests reviewed were for males, and more than 90% of the test results were below 25 µg/dL. A greater proportion of tests were for those from 25 to 34 years old, and 14% overall had Hispanic surnames. Region 2*, which reported the highest numbers of blood tests, includes the following parishes: East and West Baton Rouge, East and West Feliciana, Ascension, Iberville and Pointe Coupee. Associated with these exposures were several bridge renovation projects which occurred during that time, including the U.S. 190 Mississippi River Bridge

* map of LDH regions on page 7

painting in Baton Rouge and the Baker Canal Bridge repair in East Baton Rouge and Feliciana parishes. More than 40% of the tests were from healthcare providers located in Region 2. LDH Administrative Region was determined by patient address or by provider address as a proxy when patient address was unknown. Hispanic ethnicity was approximated by evaluating surnames (Table).

Table: Average Annual Adult Blood Lead Tests - Louisiana, 2012-2016

	Number	Percentage
Number of Tests	7548	
Number of Patients Tested	6249	
Patient Demographics		
Male	5096	82%
Female	1153	18%
Age Group		
16-24	782	13%
25-34	1628	26%
35-44	1366	22%
45-54	1177	19%
55-64	775	12%
65+	520	8%
Ethnicity		
Hispanic surname	855	14%
LDH Region		
Region 1	1196	19%
Region 2	2713	43%
Region 3	542	9%
Region 4	373	6%
Region 5	427	7%
Region 6	127	2%
Region 7	252	4%
Region 8	207	3%
Region 9	314	5%
Out-of-State	33	1%
Unknown	66	1%
Blood Lead Level (Highest per Case if Multiple)		
0 to < 10	5919	95%
10 to <25	260	4%
25 to < 45	63	1%
>45	8	<1%

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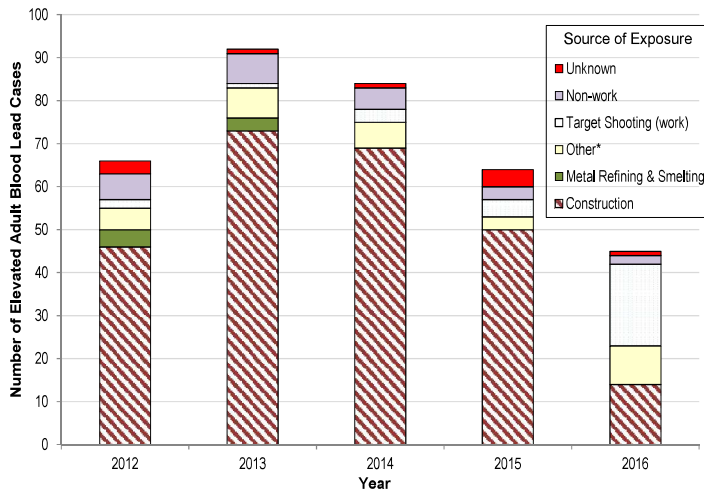
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Annually, an average of 2% of the total adult patients from 2012 to 2016 had lead levels greater than or equal to 25µg/dL. Most of the elevated tests (98%) were for males, and 28% of the patients had Hispanic surnames. Work-related exposures accounted for 90% of the elevated tests (Figure).

Figure: Elevated (greater than or equal to 25 µg/dL) Adult Blood Lead Cases by Source of Exposure - Louisiana, 2012-2016



* Other includes Law Enforcement, Oil & Gas Extraction, Transportation and all other industries not listed

Most major reference laboratories report lead data to SEET. However, a major data limitation is the lack of reporting by other labs of adult blood lead tests to SEET. Also, adults who have non-occupational exposures, i.e., target shooting, may not have their blood tested for lead.

Sources of Lead

Lead exposure often occurs during the construction of buildings and commercial structures, particularly while renovating houses painted before Environmental Protection Agency’s 1978 ban on the use of lead-based paint on residential buildings and childcare facilities. There is no federal ban on the use of lead-based paint in commercial construction. Routine testing of workers in the metal refining and smelting industry drastically declined after a major recycling plant in Louisiana closed in 2009.

Firearms instructors at shooting ranges had a notable increase in the number of elevated cases in 2016, with the occupation accounting for at least 12 of the 19 work-related target shooting cases. SEET recently developed a factsheet about how to “[Pre-vent Lead Exposure in Indoor Shooting and Firing Ranges](#)” as a guide for shooting range workers and the general public who are exposed to lead dust in these facilities.

Those who work around lead can take the dust home on their clothing and shoes. This puts the most vulnerable population, young children, pregnant women and nursing mothers, at risk of lead exposure. Some tips on preventing “[take-home exposure](#)” include: changing clothing before leaving work; washing your face and hands at the end of the work shift; and washing work clothing separately from the family’s clothing.

Common non-work-related sources of exposure were: target shooting as a hobby; casting and reloading ammunition in the home; bullets retained in the body after being shot; renovating older homes and/or furniture and crafting artwork, i.e., stained glass making. Healthcare providers can report lead test results by faxing the [form](#) to (504) 568-8149. For more information, please contact Dr. Jocelyn Lewis at jocelyn.lewis@la.gov.

(Schools and Vaccination ... continued from page 1)

OPH continues to work with individual parishes to improve rates less than the performance goal of 95%. (The Louisiana Department of Education reported 13.6% of kindergarteners were in non-public schools and 86.3% in public schools this year; sixth-graders were 13.5% in non-public schools and 86.5% in public schools.)

Louisiana law allows exemption from immunizations requirements for medical or religious/philosophical reasons. This year’s school vaccine exemption rate is 0.8% the same as the previous year, with only a slight increase from 0.6% in SY 2014-2015. Louisiana’s exemption rates remain lower than the national average, but OPH will continue to monitor these rules closely. National studies have shown that vaccine exemptions tend to cluster geographically, making some communities at greater risk for VPD outbreaks.

In 2017, the Department of Education reported there were 12,792 home study students in Louisiana. It is important to remember that although enforcement of vaccine requirements happens within the school system, vaccine recommendations for children are age-related. Having these requirements apply to all school-aged children, including home study students, protects them as well as others in all social environments, not only in school.

For more information, please contact Quan Le at quan.le@la.gov.

SAVE THE DATE

Healthcare-Associated Infections and Emerging Infectious Diseases Workshops - 2017

- Metairie - November 2
- Lafayette - November 9
- Bossier City - November 16

This is a one-day workshop sponsored by the Department of Health’s, Office of Public Health, Infectious Disease Epidemiology Section. It is targeted toward infectious disease preventionists in acute care hospitals that are seeking to reduce the number of hospital acquired infections and prepare for emerging infectious disease threats that may present in their facility.

This workshop is free to attend, but must be registered for because of seating limitations and to provide the adequate number of handouts. Nurse and laboratory education credits have been applied for.

Please go to <http://new.dhh.louisiana.gov/index.cfm/page/2853> for a registration form and more information.