

LOUISIANA OFFICE OF PUBLIC HEALTH'S HEAVY METAL SURVEILLANCE DATA



Louisiana Department of Health/Office of Public Health/Section of Environmental Epidemiology & Toxicology/Occupational Health & Injury Surveillance Program

The following tables summarize heavy metal laboratory results reported to Louisiana's Occupational Health & Injury Surveillance Program. Louisiana Law requires that healthcare providers, including clinical laboratories, report all laboratory tests for lead, mercury, cadmium, and arsenic. Test results above the action threshold are investigated to determine the source of exposure. The action threshold for each heavy metal is listed below each table. A limitation of this surveillance is that not all cases are captured, and these tables only include cases that are reported. Detailed documents describing occupational and non-occupational exposure sources, toxicity and susceptible populations, medical monitoring guidelines and result standards are available at

<http://ldh.la.gov/>

For more information about the heavy metal surveillance program or this report, contact 504.568.8159 or

[oph.seetweb@la.gov](mailto:oph.seetweb@la.gov).

**Adult Blood Lead Laboratory Surveillance (Ages 16 years and older)**

Blood Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual (2007-2016)	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	5572		5453		5641		5932		6496		6695		7982		8280		7724		7057		<b>6683</b>	
Number of patients tested	4458		4350		5007		5298		5502		5682		6274		6804		6471		6012		<b>5586</b>	
Sex																						
Male	3569	80%	3476	80%	3956	79%	4341	82%	4616	84%	4735	83%	5179	83%	5582	82%	5204	80%	4780	80%	<b>4544</b>	<b>81%</b>
Female	889	20%	874	20%	1051	21%	957	18%	886	16%	947	17%	1095	17%	1222	18%	1267	20%	1232	20%	<b>1042</b>	<b>19%</b>
Blood lead level (µg/dL)																						
0 to < 10	4060	91%	3922	90%	4625	92%	4979	94%	5193	94%	5287	93%	5894	94%	6476	95%	6165	95%	5773	96%	<b>5237</b>	<b>94%</b>
10 to <25	228	5%	241	6%	246	5%	271	5%	250	5%	330	6%	288	5%	244	4%	241	4%	195	3%	<b>253</b>	<b>5%</b>
25 to < 45	145	3%	158	4%	123	2%	43	<1%	48	<1%	62	1%	83	1%	74	1%	56	1%	38	1%	<b>83</b>	<b>1%</b>
>=45	25	<1%	29	<1%	13	<1%	5	<1%	11	<1%	5	<1%	9	<1%	10	<1%	9	<1%	7	<1%	<b>12</b>	<b>&lt;1%</b>

The blood lead action thresholds are based on the goals outlined in the CDC's "Healthy People 2020" for improving health and preventing and preventing illness and injury. The CDC aims to reduce blood lead levels of all exposed workers to <10 µg/dL. The action level for women of childbearing age is 10 µg/dL. Percentages may not add up to 100 due to rounding.

**Child Blood Lead Laboratory Surveillance (Ages 6.1 - 15 years)**

Blood Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual (2007-2016)	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	734		692		786		569		865		854		684		916		929		1478		<b>851</b>	
Number of patients tested	694		665		773		542		847		793		664		891		903		1399		<b>817</b>	
Sex																						
Male	448	65%	415	62%	441	57%	338	62%	507	60%	450	57%	408	61%	505	57%	547	61%	786	56%	<b>485</b>	<b>59%</b>
Female	246	35%	250	38%	332	43%	204	38%	340	40%	343	43%	256	39%	386	43%	356	39%	613	44%	<b>333</b>	<b>41%</b>
Blood lead level (µg/dL)																						
0 to < 10	683	98%	659	99%	765	99%	527	97%	839	99%	774	98%	660	99%	881	99%	899	100%	1385	99%	<b>807</b>	<b>99%</b>
10 to <25	11	2%	6	1%	7	1%	15	3%	7	1%	17	2%	4	1%	10	1%	4	<1%	11	1%	<b>9</b>	<b>1%</b>
25 to < 45	0	0%	0	0%	1	<1%	0	0%	1	<1%	2	<1%	0	0%	0	0%	0	0%	2	0%	<b>1</b>	<b>0%</b>
>=45	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	0%	<b>0</b>	<b>0%</b>

Reference venous blood lead level: >=10 µg/dL (CDC); percentages may not add to 100 due to rounding

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**Adult Blood Mercury Laboratory Surveillance (Ages 16 years and older)**

Blood Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007 - 2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	430		664		1159		1252		1105		1321		1048		1102		1265		1454		<b>1080</b>	
Number of patients tested	409		654		1100		1204		1050		1280		1029		1072		1243		1305		<b>1035</b>	
Sex																						
Male	237	58%	332	51%	570	52%	731	61%	661	63%	886	69%	653	63%	637	59%	778	63%	821	63%	<b>631</b>	<b>61%</b>
Female	172	42%	322	49%	530	48%	473	39%	389	37%	394	31%	376	37%	435	41%	465	37%	484	37%	<b>404</b>	<b>39%</b>
<b>Test Results: Adults (≥ 16 years)</b>																						
<b>BLOOD</b>	409	100%	654	100%	1100	100%	1204	100%	1050	100%	1280	100%	1029	100%	1072	100%	1243	100%	1305	100%	<b>1035</b>	<b>100%</b>
>10 µg/L	19	5%	20	3%	24	2%	25	2%	9	1%	11	1%	15	1%	20	2%	22	2%	13	1%	<b>18</b>	<b>2%</b>

Mercury blood action thresholds correspond to the biological exposure index (BEI) levels established by the American Conference of Industrial Hygienists for the evaluation of occupational exposures in workers.

**Adult Urine Mercury Laboratory Surveillance (Ages 16 years and older)**

Urine Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007 - 2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	1079		909		753		1107		569		773		605		743		715		761		<b>801</b>	
Number of patients tested	815		449		489		639		463		741		554		720		691		741		<b>630</b>	
Number of patients with both Blood and Urine tests	42	3%	21	2%	31	2%	42	2%	30	2%	396	20%	122	8%	56	3%	71	4%	55	3%	<b>87</b>	<b>5%</b>
Sex																						
Male	511	63%	289	64%	314	64%	373	58%	293	63%	565	76%	349	63%	389	54%	369	53%	406	55%	<b>386</b>	<b>61%</b>
Female	304	37%	160	36%	175	36%	266	42%	170	37%	176	24%	205	37%	331	46%	322	47%	335	45%	<b>244</b>	<b>39%</b>
<b>Test Results: Adults (≥ 16 years)</b>																						
<b>URINE</b>	815	100%	448	100%	489	100%	639	100%	461	100%	741	100%	554	100%	720	100%	691	100%	741	100%	<b>630</b>	<b>100%</b>
≥20 µg/g creatinine-adjusted	36	4%	34	8%	0	<1%	3	<1%	5	1%	1	<1%	1	<1%	0	<1%	3	<1%	0	<1%	<b>8</b>	<b>1%</b>

Mercury urine action thresholds correspond to the biological exposure index (BEI) levels established by the American Conference of Industrial Hygienists for the evaluation of occupational exposures in workers. The action level decreased from 35 µg/g creatinine-adjusted to 20 µg/g creatinine-adjusted based on OSHA and BEI guidelines and is reflected from 2015 forward.

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**Child Blood Mercury Laboratory Surveillance (Ages 15 and younger)**

Blood Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007 - 2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	27		62		51		47		76		56		56		72		80		88		62	
Number of patients tested	24		59		49		45		74		53		55		70		75		86		59	
Sex																						
Male	12	50%	42	71%	30	61%	29	64%	47	64%	27	51%	35	64%	50	71%	42	56%	47	55%	36	61%
Female	12	50%	17	29%	19	39%	16	36%	27	36%	26	49%	20	36%	20	29%	33	44%	39	45%	23	39%
<b>Test Results: Child (&lt; 16 years)</b>																						
<b>BLOOD</b>	24	100%	59	100%	49	100%	45	100%	74	100%	53	100%	55	100%	70	100%	75	100%	86	100%	59	100%
>10 µg/L	1	4%	1	2%	0	<1%	1	2%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	1	<1%	<1	<1%

The mercury blood action thresholds for children are the values recommended in CDC's Case Definitions for Chemical Poisoning.

**Child Urine Mercury Laboratory Surveillance (Ages 15 and younger)**

Urine Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007 - 2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	41		16		22		23		22		18		12		8		16		19		20	
Number of patients tested	32		16		20		17		22		15		12		8		16		19		18	
Number of patients with both Blood and Urine tests	3	5%	2	3%	0	0%	4	6%	4	4%	2	3%	0	0%	0	0%	1	1%	2	2%	2	2%
Sex																						
Male	26	81%	9	56%	16	80%	12	71%	14	64%	13	87%	3	25%	5	63%	7	44%	15	79%	12	68%
Female	6	19%	7	44%	4	20%	5	29%	8	36%	2	13%	9	75%	3	38%	9	56%	4	21%	6	32%
<b>Test Results: Child (&lt; 16 years)</b>																						
<b>URINE</b>	32	100%	16	100%	20	100%	17	100%	22	100%	15	100%	12	100%	8	100%	16	100%	19	100%	18	100%
>10 µg/L	2	6%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	1	5%	<1	<1%

The mercury urine action thresholds for children are the values recommended in CDC's Case Definitions for Chemical Poisoning.

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**Adult Blood Arsenic Laboratory Surveillance (Ages 16 years and older)**

Blood Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007-2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	478		577		932		997		768		658		831		725		996		1381		<b>834</b>	
Number of patients tested	468		571		912		956		754		642		798		707		980		1234		<b>802</b>	
Sex																						
Male	280	60%	357	63%	539	59%	622	65%	478	63%	419	65%	515	65%	471	67%	609	62%	781	63%	<b>507</b>	<b>63%</b>
Female	188	40%	214	37%	373	41%	334	35%	276	37%	223	35%	283	35%	236	33%	371	38%	453	37%	<b>295</b>	<b>37%</b>
<b>Test Results: Adults (≥ 16 years)</b>																						
<b>BLOOD</b>	468	100%	571	100%	912	100%	956	100%	754	100%	642	100%	798	100%	707	100%	980	100%	1234	100%	<b>802</b>	<b>100%</b>
≥70 µg/L	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	1	<1%	0	<1%	0	<1%	0	<1%	0	<1%	<b>&lt;1</b>	<b>&lt;1%</b>

The blood action level for adults corresponds to the value cited by CDC/ATSDR for use by primary care practitioners. An arsenic blood action threshold has not been established for children.

**Adult Urine Arsenic Laboratory Surveillance (Ages 16 years and older)**

Urine Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007-2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	972		591		842		1014		740		954		857		1304		1100		1127		<b>950</b>	
Number of patients tested	674		343		497		550		501		864		561		789		640		664		<b>608</b>	
Number of patients with both Blood and Urine tests	38	3%	27	3%	46	3%	41	3%	46	4%	17	1%	31	2%	22	1%	64	4%	62	3%	<b>39</b>	<b>3%</b>
Sex																						
Male	391	58%	196	57%	306	62%	297	54%	284	57%	606	70%	332	59%	460	58%	324	51%	349	53%	<b>355</b>	<b>58%</b>
Female	283	42%	147	43%	191	38%	253	46%	217	43%	258	30%	229	41%	329	42%	316	49%	315	47%	<b>254</b>	<b>42%</b>
<b>Test Results: Adults (≥ 16 years)</b>																						
<b>URINE</b>	674	100%	343	100%	497	100%	550	100%	501	100%	864	100%	561	100%	789	100%	640	100%	664	100%	<b>608</b>	<b>100%</b>
≥35 µg/L (inorganic & methylated metabolites)	0	<1%	0	<1%	1	<1%	1	<1%	2	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	<b>&lt;1</b>	<b>&lt;1%</b>
≥50 µg/g creatinine-adjusted (organic)	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	0	<1%	<b>&lt;1</b>	<b>&lt;1%</b>

The arsenic threshold for adults corresponds to the biological exposure index (BEI) level established by the American Conference of Industrial Hygienists for occupational exposures. The action level for creatinine-adjusted urine tests is based on exposure to organic Arsenic only. ARUP reports total As creatinine-adjusted for urine tests. There is no reference interval for this. An arsenic urine action threshold has not been established for children.

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**Adult Blood Cadmium Laboratory Surveillance (Ages 16 years and older)**

Blood Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007 - 2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	165		336		576		540		519		696		729		890		820		767		<b>604</b>	
Number of patients tested	160		330		456		476		449		642		671		826		785		752		<b>555</b>	
Sex																						
Male	141	88%	270	82%	350	77%	381	80%	326	73%	431	67%	436	65%	598	72%	520	66%	445	59%	<b>390</b>	<b>70%</b>
Female	19	12%	61	18%	106	23%	95	20%	123	27%	211	33%	235	35%	228	28%	265	34%	307	41%	<b>165</b>	<b>30%</b>
<b>Test Results: Adults (≥ 16 years)</b>																						
<b>BLOOD</b>	160	100%	330	100%	456	100%	476	100%	449	100%	642	100%	671	100%	826	100%	785	100%	752	100%	<b>555</b>	<b>100%</b>
≥5 µg/L	3	2%	1	<1%	1	<1%	0	<1%	0	<1%	0	<1%	1	<1%	0	<1%	0	<1%	1	<1%	<b>&lt;1</b>	<b>&lt;1%</b>

The cadmium blood action threshold is based on requirements established by OSHA for medical surveillance of workers with occupational cadmium exposure. A cadmium blood action threshold has not been established for children.

**Adult Urine Cadmium Laboratory Surveillance (Ages 16 years and older)**

Urine Tests	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Average Annual 2007 - 2016	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Number of tests received	264		285		387		308		283		752		448		484		374		467		<b>405</b>	
Number of patients tested	240		282		304		269		257		705		392		430		342		454		<b>368</b>	
Number of patients with both Blood and Urine tests	123	31%	184	30%	197	26%	136	18%	92	13%	142	11%	93	9%	261	21%	208	18%	83	7%	<b>152</b>	<b>16%</b>
Sex																						
Male	208	87%	240	85%	274	90%	237	88%	232	90%	619	88%	312	80%	336	78%	249	73%	225	50%	<b>293</b>	<b>80%</b>
Female	32	13%	42	15%	30	10%	32	12%	25	10%	86	12%	80	20%	94	22%	93	27%	229	50%	<b>74</b>	<b>20%</b>
<b>Test Results: Adults (≥ 16 years)</b>																						
<b>URINE</b>	240	100%	282	100%	304	100%	269	100%	257	100%	705	100%	392	100%	430	100%	342	100%	454	100%	<b>368</b>	<b>100%</b>
≥3 µg/g creatinine-adjusted	2	<1%	0	<1%	0	<1%	1	<1%	0	<1%	3	<1%	3	<1%	0	<1%	3	<1%	2	<1%	<b>1</b>	<b>&lt;1%</b>

The cadmium urine action threshold is based on requirements established by OSHA for medical surveillance of workers with occupational cadmium exposure. A cadmium urine action threshold has not been established for children.