

## Environmental Health Indicators

Whether we consider global warming or water quality, it is clear that our environment affects us both directly and indirectly. While some environmental health issues have existed since the beginning of the human race, most have become evident in the last few centuries. These problems have emerged as a result of our growing and changing population. The industrial revolution has created air and water pollution problems as well as overcrowding and sanitation issues. As of June 2007, over 6.6 billion people inhabited the earth.

The environment plays a role in many health issues previously discussed including birth defects, cancer, respiratory diseases, and many infectious diseases. Other concerns include allergies, fertility, and exposure to animal and insect vectors. In Iowa, public health officials are especially concerned with the quality of their drinking water, recreational waters, indoor and outdoor air quality, lead poisoning, safe housing, and hazardous and solid waste.

As we attempt to provide food, water, and shelter for the world's population, we must remain aware of how our actions affect our local and global environment. At the same time, we must monitor and attempt to prevent any adverse health conditions that are caused by interactions with the environment.

### ISSUES IN IOWA...

- ✓ Drinking water quality
- ✓ Recreational water quality
- ✓ Indoor and outdoor air quality
- ✓ Lead poisoning
- ✓ Safe housing
- ✓ Hazardous and solid waste

## Childhood Blood Lead Poisoning

Childhood lead poisoning has significant effects on the health of children and on community health. Lead has adverse effects on nearly all organ systems in the body. It is especially harmful to the developing brains and nervous systems of children under the age of six years. At very high blood lead levels, children can suffer severe brain damage or even die. At blood lead levels as low as 10 micrograms per deciliter ( $\mu\text{g/dL}$ ), a child's intelligence, hearing, and growth are affected. In a community, the presence of lead-poisoned children can be associated with an increase in the number of children with developmental deficits and learning disorders. This places an unnecessary and expensive burden on the educational system. The presence of lead-poisoned children also requires substantial community public health resources for medical and environmental case management services.

*High blood lead levels have adverse effects on nearly all organ systems in the body, and are especially harmful to children.*

Most cases of childhood lead poisoning are caused by lead-based paint, which is found in most homes built before 1960. Young children who live in pre-1960 homes become lead-poisoned when they put paint chips or exterior soil in their mouths or when they get house dust and soil on their hands and put their hands in their mouths.

Although lead poisoning can cause serious health problems – including death – most lead-poisoned children demonstrate no visible symptoms. This makes it much more important to have an effective program to prevent childhood lead poisoning.

*Most cases of childhood lead poisoning are caused by lead-based paints found in homes built before 1960.*

Since 1992, the Iowa Department of Public Health (IDPH) has recommended that all children in Iowa under the age of six years be tested for lead poisoning. In addition, state and federal laws require that all children under the age of six and covered by Medicaid be tested for lead poisoning. In spite of this, the statewide testing rates among children covered by Medicaid and children who are not covered by Medicaid are virtually identical. On April 17, 2007, Governor Culver signed legislation requiring all Iowa children to receive a blood lead test before the age of mandatory school attendance.

In Iowa, blood lead testing is conducted by the Title V Child's Health Program, local health departments, and by many private physicians. The IDPH childhood blood lead level surveillance system tracks all testing in the state. Thus, blood lead testing results collected as required by Medicaid, as well as those collected from voluntary testing of non-Medicaid children are reported to IDPH.

In the following tables, data are presented for children who were born in calendar year 1999 and 2000 and who received at least one blood lead test before their sixth birthday. Children followed for blood lead poisoning may be tested multiple times. The test results that are presented in the following tables reflect the highest blood lead level for any particular child.

For each county, the number of children receiving a blood lead test who were identified with blood levels greater than or equal to 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ). A blood level of 10  $\mu\text{g}/\text{dL}$  has been identified by the Centers for Disease Control and Prevention as the threshold for lead poisoning in children and is categorized as "high" for the graphs. Additional data, such as the percent of children in each birth cohort who were tested for lead poisoning, are also presented.

*For Iowa children born in 1999-2000, 64 percent were tested for lead poisoning, and 6.7 percent of these children had blood lead levels greater than or equal to 10  $\mu\text{g}/\text{dL}$ .*

Of the children born in Iowa in 1999, 61.5 percent received at least one blood test before their sixth birthday (range by county: 23.6 to 100 percent), and 6.9 percent of these children had blood levels greater than or equal to 10  $\mu\text{g}/\text{dL}$  (range by county: 0.0 to 22.6 percent). Of the children born in Iowa in 2000, 66.5 percent received at least one blood test before their sixth birthday (range by county: 23.3 to 100 percent), and 6.6 percent of these children had blood levels greater than or equal to 10  $\mu\text{g}/\text{dL}$  (range by county: 0.0 to 20 percent).

# Percent of Children Tested for Blood Lead Poisoning, 1999-2000<sup>1</sup>

	County	1999	2000	County	1999	2000	
	<b>Counties with Average Population &lt; 10,000</b>	Adair	77.5%	72.1%	Monona	44.3%	59.2%
Adams		80.9%	80.0%	Monroe	78.0%	64.7%	
Audubon		60.3%	87.2%	Osceola	27.4%	23.3%	
Clarke		69.2%	81.4%	Palo Alto	47.1%	54.5%	
Davis		42.2%	49.6%	Pocahontas	43.9%	43.8%	
Decatur		68.9%	76.2%	Ringgold	60.9%	66.7%	
Fremont		62.2%	67.1%	Taylor	100.0%	89.7%	
Howard		63.2%	66.4%	Van Buren	30.6%	45.4%	
Ida		50.0%	60.0%	Wayne	66.7%	97.5%	
Lucas		85.6%	89.9%	Worth	65.8%	70.2%	
				<b>County Grp %</b>	60.3%	66.6%	
<b>Counties with Average Population 10,000 – 20,000</b>		Allamakee	81.7%	89.9%	Hardin	93.6%	100.0%
		Appanoose	51.9%	54.9%	Humboldt	61.5%	87.9%
		Butler	66.0%	62.9%	Iowa	69.7%	63.4%
	Calhoun	41.7%	61.7%	Jefferson	44.9%	47.6%	
	Cass	80.0%	73.4%	Keokuk	48.8%	54.5%	
	Cedar	72.9%	68.4%	Kossuth	56.2%	50.6%	
	Cherokee	59.0%	50.0%	Louisa	67.7%	72.0%	
	Chickasaw	81.9%	78.1%	Lyon	35.7%	35.2%	
	Clay	49.7%	57.8%	Mitchell	42.1%	42.0%	
	Clayton	70.5%	83.5%	Montgomery	59.6%	64.7%	
	Crawford	72.7%	78.3%	O'Brien	30.6%	27.3%	
	Delaware	46.9%	52.0%	Page	63.3%	62.1%	
	Dickinson	25.6%	28.3%	Poweshiek	54.5%	56.6%	
	Emmet	25.8%	29.4%	Sac	40.6%	51.9%	
	Floyd	76.0%	69.8%	Shelby	54.6%	50.0%	
	Franklin	100.0%	100.0%	Tama	69.6%	78.5%	
	Greene	88.0%	100.0%	Union	60.0%	79.5%	
	Hamilton	68.4%	77.1%	Winnebago	68.6%	73.1%	
	Hancock	55.9%	64.9%	Wright	82.4%	83.9%	
			<b>County Grp %</b>	61.8%	64.7%		
<b>Counties with Average Population &gt; 20,000</b>	Boone	63.8%	76.0%	Lee	59.4%	68.3%	
	Buchanan	57.7%	64.1%	Mahaska	65.1%	74.2%	
	Buena Vista	23.6%	32.2%	Marion	74.8%	89.8%	
	Carroll	54.0%	52.7%	Marshall	100.0%	100.0%	
	Cerro Gordo	72.6%	81.7%	Muscatine	63.3%	71.9%	
	Clinton	86.8%	93.7%	Plymouth	43.6%	51.8%	
	Des Moines	81.2%	91.0%	Sioux	47.1%	41.8%	
	Fayette	63.0%	80.7%	Wapello	94.1%	100.0%	
	Henry	80.9%	83.3%	Webster	72.1%	74.8%	
	Jackson	79.8%	92.5%	Winneshiek	74.2%	74.3%	
	Jasper	44.0%	49.8%	<b>County Grp %</b>	69.0%	75.4%	
<b>MSA Counties</b>	Benton	68.7%	61.5%	Linn	67.2%	71.0%	
	Black Hawk	77.4%	81.6%	Madison	40.4%	63.8%	
	Bremer	69.1%	73.2%	Mills	62.8%	69.0%	
	Dallas	58.3%	63.3%	Polk	53.6%	59.3%	
	Dubuque	62.0%	61.4%	Pottawattamie	41.4%	56.7%	
	Grundy	79.8%	90.2%	Scott	79.1%	82.7%	
	Guthrie	52.9%	74.6%	Story	64.4%	61.6%	
	Harrison	34.6%	43.0%	Warren	43.5%	45.4%	
	Johnson	42.4%	48.4%	Washington	44.8%	60.3%	
	Jones	68.4%	80.6%	Woodbury	42.7%	48.8%	
				<b>County Grp %</b>	58.6%	63.8%	
<b>State %</b>	61.5%	66.5%					

<sup>1</sup>Children born in years 1999, 2000

Source: Iowa Department of Public Health, Bureau of Lead Poisoning Prevention

## Elevated Levels of Blood Lead: Children Born in 1999<sup>1</sup>

	County	# Born	# Tested	≥ 10 μg/dL	Total % High	County	# Born	# Tested	≥ 10 μg/dL	Total % High	
	<b>Counties with Average Population &lt; 10,000</b>	Adair	71	55	4	7.3%	Monona	115	51	3	5.9%
Adams		47	38	4	10.5%	Monroe	100	78	7	9.0%	
Audubon		68	41	3	7.3%	Osceola	73	20	0	0.0%	
Clarke		107	74	8	10.8%	Palo Alto	104	49	2	4.1%	
Davis		102	43	0	0.0%	Pocahontas	82	36	0	0.0%	
Decatur		90	62	14	22.6%	Ringgold	69	42	1	2.4%	
Fremont		98	61	5	8.2%	Taylor	66	66	12	18.2%	
Howard		117	74	6	8.1%	Van Buren	85	26	0	0.0%	
Ida		80	40	5	12.5%	Wayne	75	50	13	26.0%	
Lucas		97	83	12	14.5%	Worth	76	50	5	10.0%	
						<b>Total</b>	<b>1,722</b>	<b>1,039</b>	<b>104</b>	<b>10.0%</b>	
<b>Counties with Average Population 10,000 – 20,000</b>		Allamakee	186	152	17	11.2%	Hardin	235	220	22	10.0%
		Appanoose	158	82	3	3.7%	Humboldt	130	80	5	6.3%
	Butler	159	105	7	6.7%	Iowa	178	124	13	10.5%	
	Calhoun	103	43	1	2.3%	Jefferson	158	71	6	8.5%	
	Cass	155	124	15	12.1%	Keokuk	125	61	5	8.2%	
	Cedar	181	132	15	11.4%	Kossuth	162	91	6	6.6%	
	Cherokee	134	79	9	11.4%	Louisa	164	111	11	9.9%	
	Chickasaw	138	113	8	7.1%	Lyon	154	55	3	5.5%	
	Clay	195	97	4	4.1%	Mitchell	133	56	2	3.6%	
	Clayton	193	136	16	11.8%	Montgomery	146	87	7	8.0%	
	Crawford	205	149	18	12.1%	O'Brien	180	55	7	12.7%	
	Delaware	196	92	11	12.0%	Page	196	124	18	14.5%	
	Dickinson	172	44	2	4.5%	Poweshiek	176	96	14	14.6%	
	Emmet	124	32	2	6.3%	Sac	128	52	3	5.8%	
	Floyd	192	146	12	8.2%	Shelby	141	77	3	3.9%	
	Franklin	120	120	11	9.2%	Tama	240	167	21	12.6%	
	Greene	125	110	4	3.6%	Union	140	84	9	10.7%	
	Hamilton	206	141	14	9.9%	Winnebago	121	83	2	2.4%	
Hancock	127	71	4	5.6%	Wright	165	136	14	10.3%		
					<b>Total</b>	<b>6,141</b>	<b>3,798</b>	<b>344</b>	<b>9.1%</b>		
<b>Counties with Average Population &gt; 20,000</b>	Boone	318	203	7	3.4%	Lee	466	277	22	7.9%	
	Buchanan	298	172	9	5.2%	Mahaska	301	196	6	3.1%	
	Buena Vista	254	60	1	1.7%	Marion	432	323	10	3.1%	
	Carroll	252	136	9	6.6%	Marshall	573	573	79	13.8%	
	Cerro Gordo	551	400	18	4.5%	Muscatine	619	392	43	11.0%	
	Clinton	629	546	49	9.0%	Plymouth	289	126	14	11.1%	
	Des Moines	520	422	32	7.6%	Sioux	397	187	21	11.2%	
	Fayette	230	145	12	8.3%	Wapello	404	380	35	9.2%	
	Henry	246	199	19	9.5%	Webster	498	359	22	6.1%	
	Jackson	238	190	8	4.2%	Winneshiek	186	138	6	4.3%	
	Jasper	457	201	4	2.0%	<b>Total</b>	<b>8,158</b>	<b>5,625</b>	<b>426</b>	<b>7.6%</b>	
<b>MSA Counties</b>	Benton	265	182	10	5.5%	Linn	2,745	1,844	137	7.4%	
	Black Hawk	1,594	1,233	87	7.1%	Madison	188	76	4	5.3%	
	Bremer	236	163	7	4.3%	Mills	156	98	5	5.1%	
	Dallas	504	294	8	2.7%	Polk	5,954	3,190	128	4.0%	
	Dubuque	1,154	715	35	4.9%	Pottawattamie	1,216	503	25	5.0%	
	Grundy	104	83	2	2.4%	Scott	2,264	1,790	128	7.2%	
	Guthrie	140	74	7	9.5%	Story	885	570	20	3.5%	
	Harrison	179	62	2	3.2%	Warren	483	210	2	1.0%	
	Johnson	1,332	565	12	2.1%	Washington	306	137	8	5.8%	
	Jones	196	134	10	7.5%	Woodbury	1,627	695	73	10.5%	
						<b>Total</b>	<b>21,528</b>	<b>12,618</b>	<b>710</b>	<b>5.6%</b>	
<b>State Total</b>	<b>37,549</b>	<b>23,080</b>	<b>1,584</b>	<b>6.9%</b>							

<sup>1</sup>Children tested before six years of age

Source: Iowa Department of Public Health, Bureau of Lead Poisoning Prevention

## Elevated Levels of Blood Lead: Children Born in 2000<sup>1</sup>

	Counties with Average Population < 10,000					Counties with Average Population 10,000 – 20,000					Counties with Average Population > 20,000					MSA Counties																											
	County	# Born	# Tested	≥ 10 µg/dL	Total % High	County	# Born	# Tested	≥ 10 µg/dL	Total % High	County	# Born	# Tested	≥ 10 µg/dL	Total % High	County	# Born	# Tested	≥ 10 µg/dL	Total % High																							
Counties with Average Population < 10,000	Adair	68	49	2	4.1%	Counties with Average Population 10,000 – 20,000	Allamakee	158	142	12	8.5%	Counties with Average Population > 20,000	Boone	317	241	15	6.2%	MSA Counties	Benton	325	200	19	9.5%	Total	1,730	1,152	95	8.2%	Total	6,163	3,985	333	8.4%	Total	8,126	6,130	461	7.5%	Total	22,255	14,197	796	5.6%
	Adams	35	28	1	3.6%		Hardin	208	208	25	12.0%		Lee	410	280	21	7.5%		Linn	2,715	1,929	157	8.1%		2,715	1,929	157	8.1%															
	Audubon	47	41	2	4.9%		Humboldt	99	87	3	3.4%		Mahaska	283	210	9	4.3%		Madison	196	125	10	8.0%		196	125	10	8.0%															
	Clarke	97	79	7	8.9%		Iowa	183	116	14	12.1%		Marion	383	344	6	1.7%		Mills	155	107	9	8.4%		155	107	9	8.4%															
	Davis	129	64	2	3.1%		Jefferson	145	69	4	5.8%		Marshall	556	556	90	16.2%		Polk	6,216	3,684	157	4.3%		6,216	3,684	157	4.3%															
	Decatur	101	77	12	15.6%		Keokuk	154	84	5	6.0%		Muscatine	638	459	35	7.6%		Pottawattamie	1,184	671	25	3.7%		1,184	671	25	3.7%															
	Fremont	82	55	1	1.8%		Kossuth	166	84	2	2.4%		Plymouth	309	160	11	6.9%		Scott	2,348	1,941	118	6.1%		2,348	1,941	118	6.1%															
	Howard	110	73	2	2.7%		Louisa	164	118	5	4.2%		Sioux	457	191	12	6.3%		Story	964	594	11	1.9%		964	594	11	1.9%															
	Ida	70	42	5	11.9%		Lyon	159	56	3	5.4%		Wapello	424	424	35	8.3%		Warren	513	233	1	0.4%		513	233	1	0.4%															
	Lucas	119	107	19	17.8%		Mitchell	131	55	3	5.5%		Webster	492	368	28	7.6%		Washington	290	175	10	5.7%		290	175	10	5.7%															
							Montgomery	139	90	7	7.8%		Winneshiek	191	142	8	5.6%		Woodbury	1,692	826	91	11.0%		1,692	826	91	11.0%															
							O'Brien	187	51	6	11.8%		<b>Total</b>	8,126	6,130	461	7.5%		<b>Total</b>	22,255	14,197	796	5.6%																				
							Page	169	105	21	20.0%																																
					Poweshiek	212	120	13	10.8%																																		
					Sac	135	70	3	4.3%																																		
					Shelby	150	75	1	1.3%																																		
					Tama	251	197	16	8.1%																																		
					Union	127	101	17	16.8%																																		
					Winnebago	134	98	3	3.1%																																		
					Wright	168	141	15	10.6%																																		
					<b>Total</b>	6,163	3,985	333	8.4%																																		

<sup>1</sup>Children tested before six years of age

Source: Iowa Department of Public Health, Bureau of Lead Poisoning Prevention

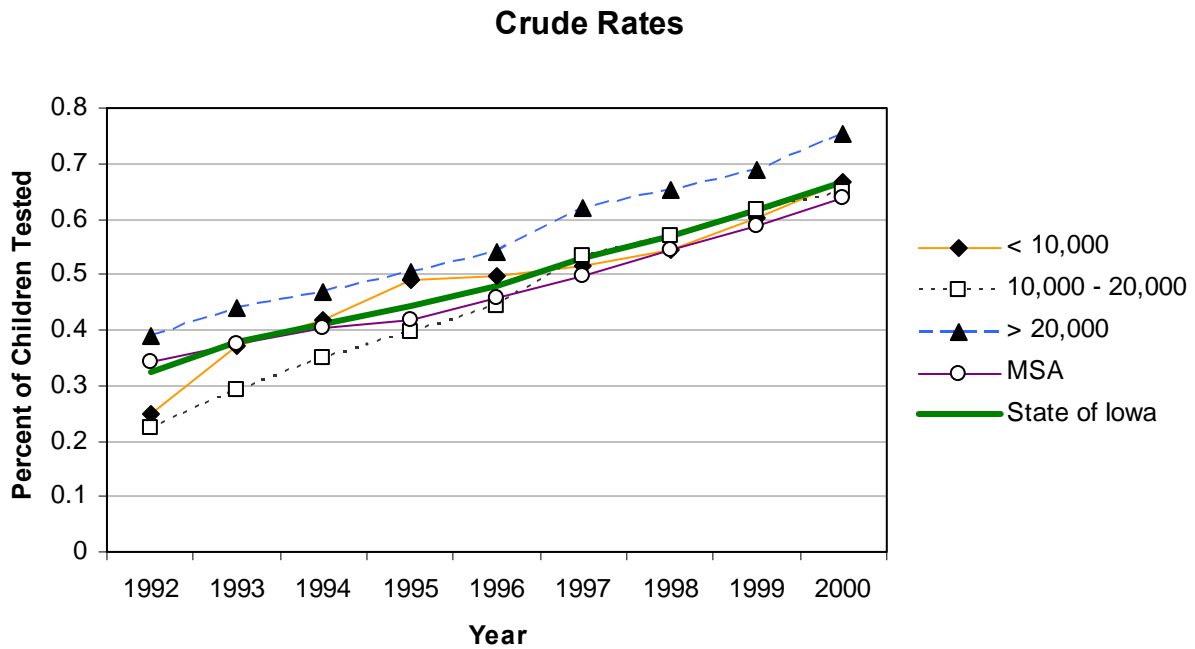
## Elevated Levels of Blood Lead: Children Born in 1999-2000<sup>1</sup>

	Counties with Average Population < 10,000			Counties with Average Population 10,000 – 20,000			Counties with Average Population > 20,000			MSA Counties		
	County	Number Tested	% with High Levels	County	Number Tested	% with High Levels	County	Number Tested	% with High Levels	County	Number Tested	% with High Levels
	Adair	104	5.8%				Monona	109	8.3%			
	Adams	66	7.6%				Monroe	144	5.6%			
	Audubon	82	6.1%				Osceola	37	5.4%			
	Clarke	153	9.8%				Palo Alto	109	2.8%			
	Davis	107	1.9%				Pocahontas	68	0.0%			
	Decatur	139	18.7%				Ringgold	88	6.8%			
	Fremont	116	5.2%				Taylor	144	16.0%			
	Howard	147	5.4%				Van Buren	70	2.9%			
	Ida	82	12.2%				Wayne	127	19.7%			
	Lucas	190	16.3%				Worth	109	6.4%			
							<b>Total</b>	2,191	9.1%			
	Allamakee	294	9.9%				Hardin	428	11.0%			
	Appanoose	160	4.4%				Humboldt	167	4.8%			
	Butler	212	7.1%				Iowa	240	11.3%			
	Calhoun	109	5.5%				Jefferson	140	7.1%			
	Cass	240	11.3%				Keokuk	145	6.9%			
	Cedar	273	9.5%				Kossuth	175	4.6%			
	Cherokee	152	9.2%				Louisa	229	7.0%			
	Chickasaw	245	7.8%				Lyon	111	5.4%			
	Clay	215	4.2%				Mitchell	111	4.5%			
	Clayton	298	11.4%				Montgomery	177	7.9%			
	Crawford	297	9.8%				O'Brien	106	12.3%			
	Delaware	210	11.0%				Page	229	17.0%			
	Dickinson	89	3.4%				Poweshiek	216	12.5%			
	Emmet	69	5.8%				Sac	122	4.9%			
	Floyd	285	9.5%				Shelby	152	2.6%			
	Franklin	233	10.3%				Tama	364	10.2%			
	Greene	202	7.4%				Union	185	14.1%			
	Hamilton	289	7.3%				Winnebago	181	2.8%			
	Hancock	156	5.1%				Wright	277	10.5%			
							<b>Total</b>	7,783	8.7%			
	Boone	444	5.0%				Lee	557	7.7%			
	Buchanan	365	7.4%				Mahaska	406	3.7%			
	Buena Vista	135	2.2%				Marion	667	2.4%			
	Carroll	274	7.3%				Marshall	1,129	15.0%			
	Cerro Gordo	833	4.0%				Muscatine	851	9.2%			
	Clinton	1,100	8.0%				Plymouth	286	8.7%			
	Des Moines	927	9.2%				Sioux	378	8.7%			
	Fayette	333	6.3%				Wapello	804	8.7%			
	Henry	419	7.6%				Webster	727	6.9%			
	Jackson	411	8.3%				Winneshiek	280	5.0%			
	Jasper	429	2.1%				<b>Total</b>	11,755	7.5%			
	Benton	382	7.6%				Linn	3,773	7.8%			
	Black Hawk	2,499	7.2%				Madison	201	7.0%			
	Bremer	346	4.6%				Mills	205	6.8%			
	Dallas	652	3.2%				Polk	6,874	4.1%			
	Dubuque	1,465	4.8%				Pottawattamie	1,174	4.3%			
	Grundy	203	4.4%				Scott	3,731	6.6%			
	Guthrie	174	8.6%				Story	1,164	2.7%			
	Harrison	145	3.4%				Warren	443	0.7%			
	Johnson	1,234	2.1%				Washington	312	5.8%			
	Jones	317	5.0%				Woodbury	1,521	10.8%			
							<b>Total</b>	26,815	5.6%			
	<b>State Total</b>	48,544	6.7%									

<sup>1</sup>Children tested before six years of age

Source: Iowa Department of Public Health, Bureau of Lead Poisoning Prevention

## Tested for Blood Lead: Children Born in 1992-2000



## Elevated Levels of Blood Lead: Children Born in 1992-2000

