Children with Lead Poisoning

DEFINITION

Children with lead poisoning is the percentage of three-year-old children with a confirmed elevated blood lead level (EBLL, ≥5 µg/dL) at any time prior to December 31, 2018.[1,2] These data are for children eligible to enter kindergarten in the fall of 2020 (i.e., children born between September 1, 2014 and August 31, 2015).

SIGNIFICANCE

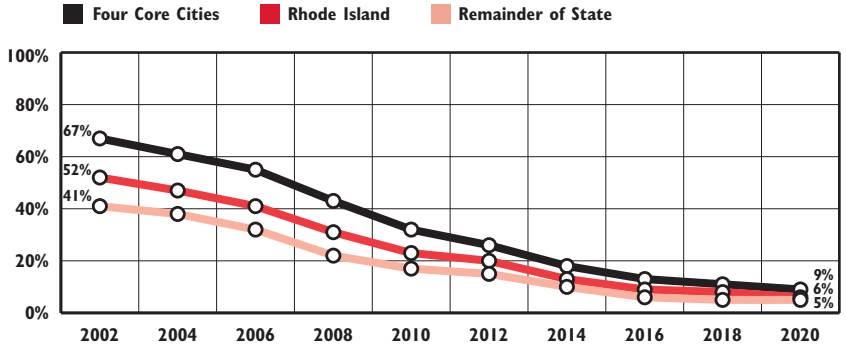
Lead poisoning is a preventable childhood disease. Infants, toddlers, and preschool-age children are most susceptible to the toxic effects of lead because they absorb lead more readily than adults and have inherent vulnerability due to developing central nervous systems.[3] Lead exposure, even at very low levels, can cause irreversible damage, including slowed growth and development, learning disabilities, behavioral problems, and neurological damage. Though rare, severe poisoning can result in seizures, comas, and even death.[4,5] The societal costs of childhood lead poisoning include the loss of future earnings due to decreased intelligence, and increased medical, special education, and juvenile justice costs.[6,7] Children can be exposed to lead in the places they spend the most time. Homes, schools, and child care settings can be contaminated with lead from paint or paint dust if built before 1978. Children can also be exposed to lead poising through corrosion of lead service lines where a house or building's water pipe connects to the public water main.[8]

There is no safe lead level in children. In an effort to better alert health officials and families to the dangers of any lead exposure in children, in 2012 the CDC lowered the threshold for which a child is deemed to have an elevated blood lead level from 10 µg/dL to 5 µg/dL. This new lower reference value allows parents and health officials to take corrective actions sooner.[9,10,11]

Although the percentage of children with elevated blood lead levels is declining nationally and in Rhode Island, low-income children are at higher risk of lead exposure.[12,13] In Rhode Island, children living in the four core cities are at increased risk for lead exposure because the housing stock tends to be older.[14]

In 2018, 635 (3%) of the 23,031 Rhode Island children under age six who were screened had confirmed elevated blood lead levels of ≥5 µg/dL. Children living in the four core cities (4%) were four times as likely as children in the remainder of the state (1%) to have confirmed elevated blood lead levels ≥5 µg/dL.[15]

Children Entering Kindergarten with History of Elevated* Blood Lead Level Screening (≥5 µg/dL), Rhode Island, Four Core Cities, and Remainder of State, 2002-2020



Source: Rhode Island Department of Health, Healthy Homes and Childhood Lead Poisoning Prevention Program, Children entering kindergarten between 2002 and 2020. *Elevated blood lead level of ≥5 µg/dL.

◆ **The number of children with elevated blood lead levels has been steadily declining in all areas of Rhode Island over the past two decades. Compared to the remainder of the state, the core cities have nearly twice the rate of children with elevated blood levels.[16]**

Lead Exposure and Academic Performance

◆ **Exposure to lead has been shown to negatively impact academic performance in early childhood.[17] Rhode Island children with a history of lead exposure, even at low levels, have been shown to have decreased reading readiness at kindergarten entry and diminished reading and math proficiency in the third grade. The most significant declines in academic performance occurred among children with the highest blood lead levels living in the four core cities. Children with lead exposure are also at increased risked for absenteeism, grade repetition, and special education services.[18,19]**

◆ **A 2016 Department of Health initiative tested schools for lead in drinking water. The results and recommendations for action are available by school on the Department of Health website.[20,21]**

Significantly Lead Poisoned Children Under Age Six

◆ Starting in 2015, a child is considered to be "significantly lead poisoned" if she or he has a single venous blood test result of ≥15 µg/dL. The number of children under age six who were significantly lead poisoned has decreased by 81% over the past 13 years, from 349 in 2005 to 68 in 2018.[22]

◆ Starting in 2015, an environmental inspection of a child's home is offered when a single venous test is ≥15 µg/dL (versus ≥20 µg/dL previously). The Rhode Island Department of Health sends certified lead inspectors to determine whether lead hazards are present and works with owners to make the property lead-safe. In 2018, 116 environmental inspections were offered, of which 67 were performed, 18 were refused, 18 were pending, and 13 the child had moved.[23]

Lead Poisoning Screening for Children Age Three

◆ All Rhode Island children must have at least two blood lead screening tests by age three and annual screening through age six. Lead screening is a mandated covered health insurance benefit in Rhode Island. By the end of 2018, 79% of Rhode Island three-year-olds had received at least one blood test, 51% had received at least two blood tests, and 21% were never tested.[24,25,26]

Table 23. **Lead Poisoning in Children Entering Kindergarten in the Fall of 2020, Rhode Island**

CITY/TOWN	NUMBER TESTED FOR LEAD POISONING	CONFIRMED WITH BLOOD LEAD LEVEL ≥5 µg/dL	
		NUMBER	PERCENT
Barrington	181	4	*
Bristol	145	11	7.6% ^
Burrillville	155	2	*
Central Falls	307	28	9.1%
Charlestown	36	2	*
Coventry	309	7	*
Cranston	768	52	6.8%
Cumberland	337	8	*
East Greenwich	158	5	*
East Providence	448	31	6.9%
Exeter	56	2	*
Foster	38	2	*
Glocester	57	2	*
Hopkinton	55	4	*
Jamestown	28	0	0.0%
Johnston	286	8	*
Lincoln	217	7	*
Little Compton	25	5	*
Middletown	201	8	*
Narragansett	61	3	*
New Shoreham	7	2	*
Newport	285	15	5.3% ^
North Kingstown	244	11	4.5% ^
North Providence	308	11	3.6% ^
North Smithfield	78	4	*
Pawtucket	872	51	5.8%
Portsmouth	130	2	1.5%
Providence	2,600	265	10.2%
Richmond	48	4	*
Scituate	101	1	*
Smithfield	122	0	0.0%
South Kingstown	179	7	*
Tiverton	127	7	*
Warren	107	11	10.3 ^
Warwick	741	30	4.0%
West Greenwich	47	0	0.0%
West Warwick	302	20	6.6%
Westerly	177	4	*
Woonsocket	589	26	4.4%
Unknown Residence	*2*	*NA*	*NA*
Four Core Cities	*4,368*	*370*	*8.5%*
Remainder of State	*6,564*	*292*	*4.4%*
Rhode Island	*10,934*	*662*	*6.1%*

Source of Data for Table/Methodology

Rhode Island Department of Health, Healthy Homes and Childhood Lead Poisoning Prevention Program.

Data reported in this year's Factbook is not comparable to editions prior to 2012, due to a change in definition and data improvements within the Healthy Homes and Childhood Lead Poisoning Prevention Program.

Data for children entering kindergarten in the fall of 2020 reflect the number of Rhode Island children eligible to enter school in the fall of 2020 (i.e., born between 9/1/14 and 8/31/15).

Children confirmed positive for lead poisoning (blood lead level ≥5 g/dL) are counted if they screened positive with a venous test and/or had a confirmed capillary test at any time in their lives prior to the end of December 2018. The Rhode Island Healthy Homes and Childhood Lead Poisoning Prevention Program recommends that children under age six with a capillary blood lead level of ≥5 g/dL receive a confirmatory venous test.

The denominator for percent confirmed is the number of children entering kindergarten in the fall of 2020 who were tested for lead poisoning. Data include both venous and confirmed capillary tests.

Of the 727 children entering kindergarten in 2020 who had an initial blood lead screen of ≥5 g/dL, six did not receive a confirmatory second test. Their lead poisoning status is unknown.

Unknown: Children were Rhode Island residents, but specific city/town information was unavailable.

Core cities are Central Falls, Pawtucket, Providence, and Woonsocket.

See Methodology Section for more information.

References

[1,10] Centers for Disease Control and Prevention. (n.d.). *Blood lead levels in children.* Retrieved February 20, 2019, from www.cdc.gov

[2,25] Rhode Island Department of Health. (2018). *Childhood lead poisoning prevention program referral intervention process.* Retrieved February 22, 2019, from www.health.ri.gov

(continued on page 180)