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, 2017.[1,2] These data are for children eligible to enter kindergarten in the fall of 2019 (i.e., children born between September 1, 2013 and August 31, 2014).

SIGNIFICANCE

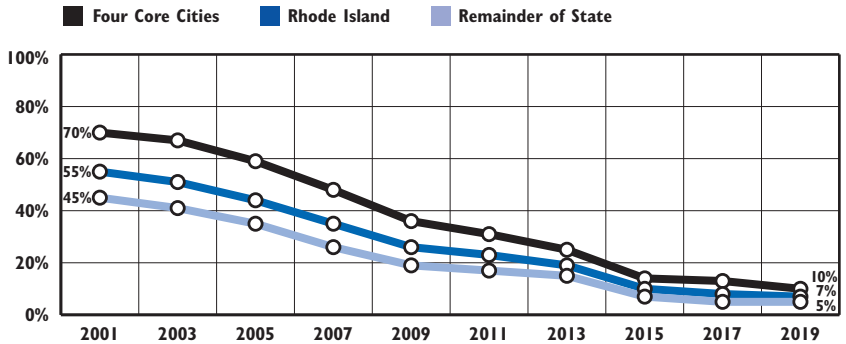
Lead poisoning is a preventable childhood disease. Infants, toddlers, and preschool-age children are most susceptible to the toxic effects of lead because they absorb lead more readily than adults and have inherent vulnerability due to developing central nervous systems.[3] Lead exposure, even at very low levels, can cause irreversible damage, including decreased hearing, delayed puberty, kidney damage, increased risk for behavioral problems, decreased cognitive abilities, and lower academic performance. 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 cognition, and increased medical, special education, and juvenile justice costs.[6,7,8] Children can be exposed to lead in the places they spend the most time. Homes, schools, child care settings, and the surrounding soil can be contaminated with lead from paint or paint dust if built before 1978. Children can also be exposed to lead poisoning through corrosion of lead service lines where a house or building's water pipe connects to the public water main.[9]

There is no safe blood 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.[10,11]

Although the percentage of children with elevated blood lead levels is declining nationally and in Rhode Island, low-income children and children of color remain the most likely to be lead poisoned.[12,13,14] 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.[15]

In 2017, 953 (4%) of the 24,501 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 (6%) were more than twice as likely as children in the remainder of the states (3%) to have confirmed elevated blood lead levels ≥5 µg/dL.[16]

Children Entering Kindergarten with History of Elevated* Blood Lead Level Screening (≥5 µg/dL), Rhode Island, Four Core Cities, and Remainder of State, 2001-2019



Source: Rhode Island Department of Health, Healthy Homes and Childhood Lead Poisoning Prevention Program, Children entering kindergarten between 2001 and 2019. *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 twice the rate of children with elevated blood levels.[17]**

Lead Exposure and Academic Performance

◆ **Exposure to lead has been shown to negatively impact academic performance in early childhood.[18] 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.[19,20]**

◆ **In an effort to better inform school administrators about the prevalence of lead exposure, the Rhode Island Department of Health and the Rhode Island Department of Education provide detailed reports to superintendents and heads of private schools on rates of lead exposure and immunization among students within their respective districts. Information regarding screenings, regulations, associated risks, and parent communication are also included.[21,22]**

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 82% over the past 12 years, from 349 in 2005 to 64 in 2017.[23]

◆ 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 properties lead-safe. In 2017, 112 environmental inspections were offered, of which 64 were performed, 22 were refused, nine were pending, and 17 the child moved.[24]

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. In 2017, 76% of Rhode Island three-year-olds with an active status in KIDSNET received one blood lead test, 56% received two blood tests, and 24% were never tested.[25,26,27]

Table 23. **Lead Poisoning in Children Entering Kindergarten in the Fall of 2019, Rhode Island**

CITY/TOWN	NUMBER TESTED FOR LEAD POISONING	CONFIRMED WITH BLOOD LEAD LEVEL ≥5 µg/dL	
		NUMBER	PERCENT
Barrington	163	*	*
Bristol	157	9	5.7%
Burrillville	125	*	*
Central Falls	300	32	10.7%
Charlestown	44	*	*
Coventry	255	10	3.9%
Cranston	719	49	6.8%
Cumberland	334	11	3.3%
East Greenwich	156	*	*
East Providence	469	40	8.5%
Exeter	35	*	*
Foster	40	*	*
Glocester	65	*	*
Hopkinton	72	*	*
Jamestown	22	*	*
Johnston	250	9	3.6%
Lincoln	189	9	4.8%
Little Compton	11	0	0.0%
Middletown	193	7	3.6%
Narragansett	56	*	*
New Shoreham	8	0	0.0%
Newport	294	23	7.8%
North Kingstown	254	*	*
North Providence	294	10	3.4%
North Smithfield	87	0	0.0%
Pawtucket	841	73	8.7%
Portsmouth	134	6	4.5%
Providence	2,573	292	11.3%
Richmond	34	*	*
Scituate	96	6	6.3%
Smithfield	125	6	4.8%
South Kingstown	215	12	5.6%
Tiverton	122	6	4.9%
Warren	106	9	8.5%
Warwick	712	21	2.9%
West Greenwich	46	0	0.0%
West Warwick	302	15	5.0%
Westerly	186	7	3.8%
Woonsocket	603	36	6.0%
Unknown Residence	*2*	*NA*	*NA*
Four Core Cities	*4,317*	*433*	*10.0%*
Remainder of State	*6,370*	*296*	*4.6%*
Rhode Island	*10,689*	*729*	*6.8%*

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 2019 reflect the number of Rhode Island children eligible to enter school in the fall of 2019 (i.e., born between 9/1/13 and 8/31/14).

Children confirmed positive for lead poisoning (blood lead level ≥5 µg/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 2017. 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 µg/dL receive a confirmatory venous test.

The denominator for percent confirmed is the number of children entering kindergarten in the fall of 2019 who were tested for lead poisoning. Data include both venous and confirmed capillary tests.

Of the 743 children entering kindergarten in 2018 who had an initial blood lead screen of ≥5 µg/dL, fourteen did not receive a confirmatory second test. Their lead poisoning status is unknown.

* The data are statistically unreliable and rates are not reported and should not be calculated.

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

[1,11] Centers for Disease Control and Prevention. (n.d.). *Blood lead levels in children.* Retrieved February 20, 2018, from www.cdc.gov

[2,25] Rhode Island Department of Health. (2016). *Childhood lead poisoning prevention program referral intervention process.* Retrieved February 21, 2018, from www.health.ri.gov

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