

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 $\mu\text{g}/\text{dL}$) at any time prior to December 31, 2019.^{1,2} These data are for children eligible to enter kindergarten in the fall of 2021 (i.e., children born between September 1, 2015 and August 31, 2016).

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

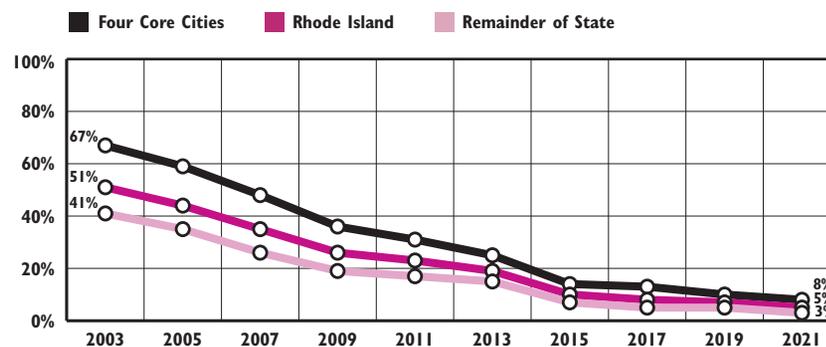
paint or paint dust if built before 1978. Children can also be exposed to lead poisoning through corrosion of lead service lines where the water pipe from a house or building connects to the public water main.⁸

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 $\mu\text{g}/\text{dL}$ to 5 $\mu\text{g}/\text{dL}$. This new lower reference value allows parents and health officials to take corrective actions sooner.^{9,10}

Although the percentage of children with elevated blood lead levels is declining nationally and in Rhode Island, low-income children continue to be at higher risk of lead exposure. 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.^{11,12,13}

In 2019, 579 (2%) of the 23,947 Rhode Island children under age six who were screened had confirmed elevated blood lead levels of ≥ 5 $\mu\text{g}/\text{dL}$. 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 of ≥ 5 $\mu\text{g}/\text{dL}$.¹⁴

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Children Entering Kindergarten with History of Elevated* Blood Lead Level Screening (≥ 5 $\mu\text{g}/\text{dL}$), Rhode Island, Four Core Cities, and Remainder of State, 2003-2021



Source: Rhode Island Department of Health, Healthy Homes and Childhood Lead Poisoning Prevention Program, Children entering kindergarten between 2003 and 2021. *Elevated blood lead level of ≥ 5 $\mu\text{g}/\text{dL}$.

◆ **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 four core cities have more than twice the rate of children with elevated blood levels.**¹⁵

◆ ■■■■■◆ Lead Exposure and Academic Performance

◆ **Exposure to lead has been shown to negatively impact academic performance in early childhood.¹⁶ 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 risk for absenteeism, grade repetition, and special education services.**^{17,18}

◆ **A 2016 Rhode Island 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's website.**^{19,20}

Table 23. Lead Poisoning in Children Entering Kindergarten in the Fall of 2021, Rhode Island

CITY/TOWN	NUMBER TESTED FOR LEAD POISONING	CONFIRMED WITH BLOOD LEAD LEVEL ≥ 5 $\mu\text{g/dL}$	
		NUMBER	PERCENT
Barrington	184	3	*
Bristol	151	5	*
Burrillville	129	3	*
Central Falls	300	26	8.7%
Charlestown	51	0	*
Coventry	289	7	*
Cranston	772	26	3.4%
Cumberland	352	6	*
East Greenwich	148	2	*
East Providence	491	16	3.3%^
Exeter	47	0	*
Foster	29	0	*
Glocester	63	1	*
Hopkinton	67	4	*
Jamestown	24	1	*
Johnston	241	4	*
Lincoln	213	7	*
Little Compton	15	1	*
Middletown	213	4	*
Narragansett	50	3	*
New Shoreham	16	2	*
Newport	265	20	7.5%^
North Kingstown	254	3	*
North Providence	331	3	*
North Smithfield	100	3	*
Pawtucket	833	46	5.5%
Portsmouth	146	4	*
Providence	2,636	226	8.6%
Richmond	39	2	*
Scituate	91	2	*
Smithfield	141	3	*
South Kingstown	200	8	*
Tiverton	132	3	*
Warren	83	2	*
Warwick	751	15	2.0%^
West Greenwich	30	0	*
West Warwick	325	7	*
Westerly	164	4	*
Woonsocket	539	23	4.3%^
Unknown Residence	1	NA	NA
Four Core Cities	4,308	321	7.5%
Remainder of State	6,597	174	2.6%
Rhode Island	10,906	495	4.5%

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 $\mu\text{g/dL}$. The number of children under age six who were significantly lead poisoned has decreased by 84% over the past 14 years, from 349 in 2005 to 55 in 2019.²¹

Starting in 2015, an environmental inspection of a child’s home is offered when a single venous test is ≥ 10 $\mu\text{g/dL}$ (versus ≥ 15 $\mu\text{g/dL}$ 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 2019, 105 environmental inspections were offered, of which 70 were performed, 21 were refused, nine were pending, and five of the children had moved.²²

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 2019, 75% of Rhode Island three-year-olds had received at least one blood test, 55% had received at least two blood tests, and 25% were never tested.^{23,24,25}

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 are 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 2021 reflect the number of Rhode Island children eligible to enter school in the fall of 2021 (i.e., born between 9/1/15 and 8/31/16).

Children confirmed positive for lead poisoning (blood lead level ≥ 5 $\mu\text{g/dL}$) 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 2019. 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 $\mu\text{g/dL}$ receive a confirmatory venous test.

The denominator for percent confirmed is the number of children entering kindergarten in the fall of 2021 who were tested for lead poisoning. Data include both venous and confirmed capillary tests.

Of the 548 children entering kindergarten in 2021 who had an initial blood lead screen of ≥ 5 $\mu\text{g/dL}$, 10 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

¹¹⁰ Centers for Disease Control and Prevention. (2019). *Blood lead levels in children*. Retrieved February 19, 2020, from www.cdc.gov

²²⁴ Rhode Island Department of Health. (2019). *Childhood lead poisoning prevention program referral intervention process*. Retrieved February 19, 2020, from www.health.ri.gov

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