

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, 2020.^{1,2} These data are for children eligible to enter kindergarten in the fall of 2022 (i.e., children born between September 1, 2016 and August 31, 2017).

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 cognitive impairment, 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

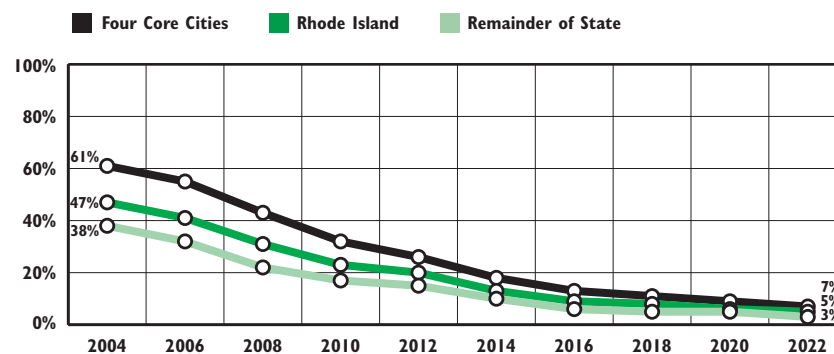
paint or paint dust if built before 1978. Children can also be exposed to lead poisoning through corrosion of lead service lines where the water pipe from a house or building connects to the public water main.⁸

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 2020, 631 (3%) of the 19,722 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 (5%) were more likely than children in the remainder of the state (2%) to have confirmed elevated blood lead levels of ≥ 5 $\mu\text{g}/\text{dL}$. The number of lead screenings has declined due to the COVID-19 pandemic.¹⁴

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, 2004-2022



Source: Rhode Island Department of Health, Healthy Homes and Childhood Lead Poisoning Prevention Program, Children entering kindergarten between 2004 and 2022. *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. 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 2022, Rhode Island

CITY/TOWN	NUMBER TESTED FOR LEAD POISONING	CONFIRMED WITH BLOOD LEAD LEVEL ≥ 5 $\mu\text{g/dL}$	
		NUMBER	PERCENT
Barrington	165	0	0.0%
Bristol	154	4	2.6%
Burrillville	120	4	3.3%
Central Falls	307	22	7.2%
Charlestown	46	1	2.2%
Coventry	274	3	1.1%
Cranston	718	20	2.8%
Cumberland	341	2	0.6%
East Greenwich	145	1	0.7%
East Providence	460	11	2.4%
Exeter	43	0	0.0%
Foster	27	0	0.0%
Glocester	56	2	3.6%
Hopkinton	67	1	1.5%
Jamestown	31	0	0.0%
Johnston	250	5	2.0%
Lincoln	164	1	0.6%
Little Compton	17	1	5.9%
Middletown	171	1	0.6%
Narragansett	42	1	2.4%
New Shoreham	10	1	10.0%
Newport	229	14	6.1%
North Kingstown	232	5	2.2%
North Providence	268	7	2.6%
North Smithfield	91	1	1.1%
Pawtucket	848	53	6.3%
Portsmouth	148	0	0.0%
Providence	2,477	167	6.7%
Richmond	51	1	2.0%
Scituate	80	2	2.5%
Smithfield	157	1	0.6%
South Kingstown	179	2	1.1%
Tiverton	124	3	2.4%
Warren	81	2	2.5%
Warwick	675	11	1.6%
West Greenwich	47	0	0.0%
West Warwick	278	11	4.0%
Westerly	153	4	2.6%
Woonsocket	561	27	4.8%
Unknown Residence	1	NA	NA
Four Core Cities	4,193	269	6.4%
Remainder of State	6,094	123	2.0%
Rhode Island	10,288	392	3.8%



Significantly Lead Poisoned Children Under Age Six

◆ The number of children under age six in Rhode Island who had a confirmed venous blood test result of ≥ 15 $\mu\text{g/dL}$ has decreased by 81% over the past 15 years, from 349 in 2005 to 66 in 2020.²¹

◆ An environmental inspection of a child's home is offered when a single venous test is ≥ 10 $\mu\text{g/dL}$. 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 2020, 94 environmental inspections were offered, of which 65 were performed, 11 were refused or had no response, five were pending, and 13 of the children had moved.^{22,23}



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 2019 (the most recent year data are available), 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.^{24,25,26}

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 2022 reflect the number of Rhode Island children eligible to enter school in the fall of 2022 (i.e., born between 9/1/16 and 8/31/17).

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 2020. 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 2022 who were tested for lead poisoning. Data include both venous and confirmed capillary tests.

Of the 472 children entering kindergarten in 2022 who had an initial blood lead screen of ≥ 5 $\mu\text{g/dL}$, 29 did not receive a confirmatory second test. Their lead poisoning status is unknown.

[^]The data are statistically unstable and rates or percentages should be interpreted with caution.

^{*}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

¹¹⁰ Centers for Disease Control and Prevention. (n.d.). *Blood lead levels in children*. Retrieved March 26, 2021, from www.cdc.gov

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