

# 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,  $\geq 5$   $\mu\text{g}/\text{dL}$ ) at any time prior to December 31, 2021.<sup>1,2</sup> These data are for children eligible to enter kindergarten in the fall of 2023 (i.e., children born between September 1, 2017 and August 31, 2018).

## 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.<sup>3</sup> 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.<sup>4,5</sup> 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.<sup>6,7</sup> 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

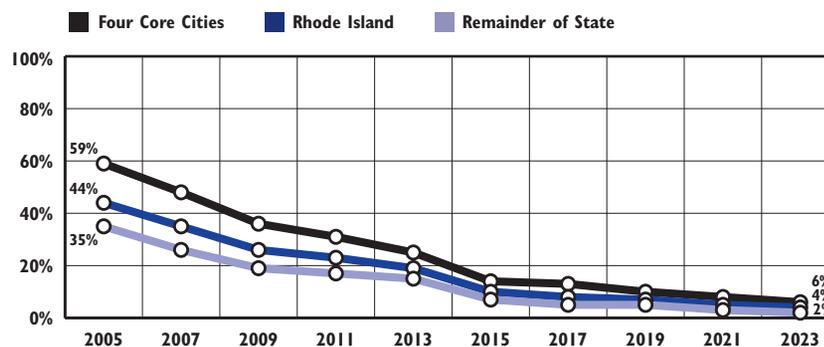
paint or paint dust if built before 1978. Children can also be exposed to lead poisoning through corrosion of lead service lines where the water pipe from a house or building connects to the public water main.<sup>8</sup>

There is no safe lead level in children. In late 2021, the Centers for Disease Control and Prevention lowered the threshold for which a child is considered to have an elevated blood lead level from 5  $\mu\text{g}/\text{dL}$  to 3.5  $\mu\text{g}/\text{dL}$ . This new lower reference value will allow parents and health officials to take corrective actions sooner.<sup>9,10</sup>

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.<sup>11,12,13</sup>

In 2021, 602 (2.7%) of the 22,385 Rhode Island children under age six who were screened had confirmed elevated blood lead levels of  $\geq 5$   $\mu\text{g}/\text{dL}$ . Children living in the four core cities (4.4%) were three times as likely than children in the remainder of the state (1.4%) to have confirmed elevated blood lead levels of  $\geq 5$   $\mu\text{g}/\text{dL}$ .<sup>14</sup>

**Children Entering Kindergarten with History of Elevated\* Blood Lead Level Screening ( $\geq 5$   $\mu\text{g}/\text{dL}$ ), Rhode Island, Four Core Cities, and Remainder of State, 2005-2023**



Source: Rhode Island Department of Health, Healthy Homes and Childhood Lead Poisoning Prevention Program, Children entering kindergarten between 2005 and 2023. \*Elevated blood lead level of  $\geq 5$   $\mu\text{g}/\text{dL}$ .

◆ 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 three times the rate of children with elevated blood levels.<sup>15</sup>

## Lead Exposure and Academic Performance

◆ Exposure to lead has been shown to negatively impact academic performance in early childhood.<sup>16</sup> 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.<sup>17,18</sup>

◆ 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.<sup>19,20</sup>

# Children with Lead Poisoning

Table 23. Lead Poisoning in Children Entering Kindergarten in the Fall of 2023, Rhode Island

CITY/TOWN	NUMBER TESTED FOR LEAD POISONING	CONFIRMED WITH BLOOD LEAD LEVEL $\geq 5$ $\mu\text{g/dL}$	
		NUMBER	PERCENT
Barrington	173	<5	*
Bristol	135	<5	*
Burrillville	123	<5	*
Central Falls	314	25	8.0%
Charlestown	48	0	0.0%
Coventry	290	0	0.0%
Cranston	791	30	3.8%
Cumberland	357	8	2.2%
East Greenwich	149	<5	*
East Providence	515	20	3.9%
Exeter	56	<5	*
Foster	36	0	0.0%
Glocester	57	0	0.0%
Hopkinton	64	0	0.0%
Jamestown	26	0	0.0%
Johnston	267	<5	*
Lincoln	180	<5	*
Little Compton	13	0	0.0%
Middletown	181	<5	*
Narragansett	43	<5	*
New Shoreham	<5	0	0.0%
Newport	238	6	2.5%
North Kingstown	267	<5	*
North Providence	339	<5	*
North Smithfield	97	<5	*
Pawtucket	969	43	4.4%
Portsmouth	175	<5	*
Providence	2,633	174	6.6%
Richmond	57	<5	*
Scituate	100	<5	*
Smithfield	145	<5	*
South Kingstown	166	<5	*
Tiverton	118	<5	*
Warren	110	<5	*
Warwick	742	11	1.5%
West Greenwich	52	0	0.0%
West Warwick	310	5	1.6%
Westerly	157	5	3.2%
Woonsocket	531	24	4.5%
Four Core Cities	4,447	266	6.0%
Remainder of State	6,579	125	1.9%
Rhode Island	11,026	391	3.5%

## 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  $\geq 15$   $\mu\text{g/dL}$  has decreased by 78% over the past 16 years, from 349 in 2005 to 76 in 2021.<sup>21</sup>

◆ An environmental inspection of a child's home is offered when a single venous test is  $\geq 10$   $\mu\text{g/dL}$ . 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 2021, 110 environmental inspections were offered, of which 63 were performed, 32 were refused or had no response, and four of the children had moved.<sup>22,23</sup>

## 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 2021 (the most recent year data are available), 73% of Rhode Island three-year-olds had received at least one blood test, 51% had received at least two blood tests, and 19% were never tested.<sup>24,25,26</sup>

### 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 2023 reflect the number of Rhode Island children eligible to enter school in the fall of 2023 (i.e., born between 9/1/17 and 8/31/18).

Children confirmed positive for lead poisoning (blood lead level  $\geq 5$   $\mu\text{g/dL}$ ) 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 2021. The Rhode Island Healthy Homes and Childhood Lead Poisoning Prevention Program recommends that children under age six with a capillary blood lead level of  $\geq 5$   $\mu\text{g/dL}$  receive a confirmatory venous test.

The denominator for percent confirmed is the number of children entering kindergarten in the fall of 2023 who were tested for lead poisoning. Data include both venous and confirmed capillary tests.

Of the 481 children entering kindergarten in 2023 who had an initial blood lead screen of  $\geq 5$   $\mu\text{g/dL}$ , 128 did not receive a confirmatory second test. Their lead poisoning status is unknown.

\*The data are not reported in accordance with the Rhode Island Department of Health's small number data policy.

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

See Methodology Section for more information.

### References

<sup>110</sup> Centers for Disease Control and Prevention. (2021). *Blood lead reference value*. Retrieved March 11, 2022, from [www.cdc.gov](http://www.cdc.gov)

<sup>224</sup> Rhode Island Department of Health. (n.d.). *Childhood lead poisoning prevention program referral intervention process*. Retrieved March 11, 2022, from <https://health.ri.gov>

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