

How Ready Is Providence?

CHILDREN UNDER 6 WITH ELEVATED BLOOD LEAD LEVELS

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Why is it important?

Researchers, health professionals, and advocates, both nationally and locally, have long experienced frustration about lead poisoning because children who are lead poisoned suffer the consequences for life – yet poisoning is completely preventable. Visible symptoms occur only in extreme cases, but even low levels of lead harm children’s brains, kidneys, and other organs. Known consequences can cause long-term learning difficulties and behavioral problems such as aggressive and criminal behaviors later in life.^{1,2}

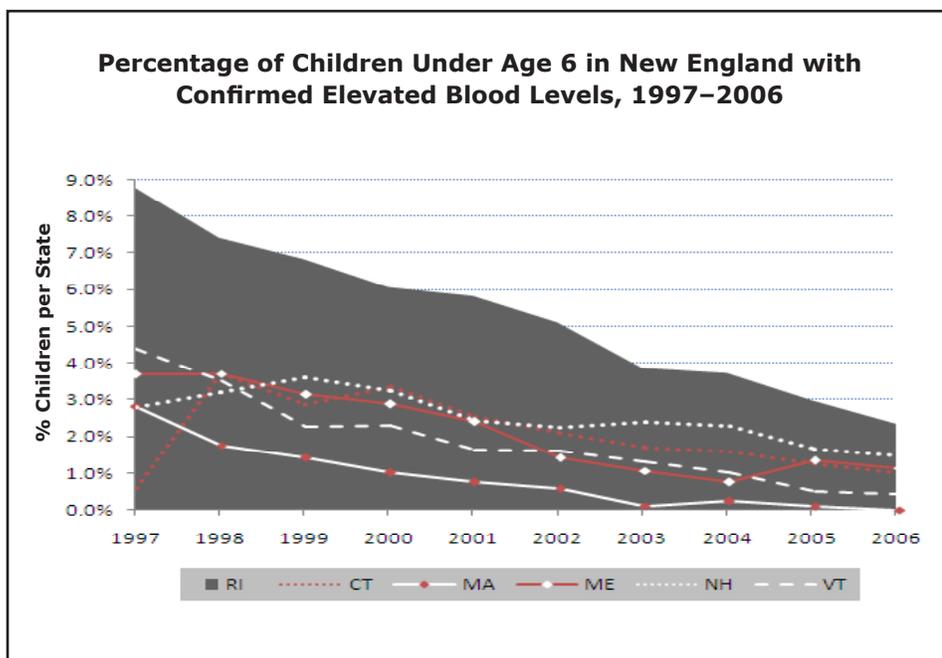
Children are at greater risk of lead poisoning than adults as their bodies absorb lead more readily.³ Low-income and minority children living in central cities with older, poorly maintained

housing are at particular risk of lead poisoning because, though banned from interior use in 1978, lead-based paint remains a primary source of lead poisoning.⁴ Nutrition also influences the effects of lead since lead is less hazardous to children if their stomachs are full and if they are receiving proper amounts of iron, calcium, and vitamin C (which help protect the body and reduce lead absorption),⁵ yet another challenge facing low-income families.

Although lead toxicity was described in ancient Egyptian papyrus scrolls and lead exposure was linked directly to negative effects by the 1st century A.D., lead poisoning has continued to be widespread for centuries.⁶ And unlike many Eu-

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Figure 1



The grey area of Figure 1, representing the percentage of children in Rhode Island with confirmed elevated blood lead levels, contrasts sharply with the other New England states. Lead poisoning has remained consistently higher in Rhode Island than other states in the region. See Endnote 16 for detailed state-by-state data.

Source: Centers for Disease Control and Prevention

This report is an update of an indicator initially addressed in *How Ready Is Providence?*, released by Ready to Learn Providence in 2004.

Why is it important?

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European countries that imposed indoor lead paint laws in the 1920s, by 1970 only four U.S. states and ten municipalities had such prohibitions despite 250,000 cases of lead poisoning that same year.⁷ In 1991, the U.S. Department of Health and Human Services announced a comprehensive plan to prevent lead poisoning by focusing on primary prevention, the pro-active removal of environmental lead hazards, and a reduction in lead contaminant sources in order to eliminate childhood lead poisoning by 2010.⁸ As the medical effects of lead exposure have been better understood, acceptable blood lead levels have been gradually lowered by the Center for Disease Control (CDC) to the current threshold of 10 micrograms per deciliter (ug/dL).⁹

Nationally, the push towards lead poisoning prevention has been met with success. The CDC Lead Poisoning Prevention Branch reports that lead screenings of children under the age of six doubled between 1997 and 2006 (yet still represents just 14% of the under

six population in the U.S.).¹⁰ Screening tests refer to the blood lead levels of children who have not been previously identified as lead poisoned. Elevated blood lead levels are confirmed with a

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second test. Rates of confirmed lead poisoning cases may be lower than screening rates because of false positive results or because children were not tested a second time and their lead poisoning status is unknown.¹¹ Of all U.S. children tested in 2007, 1.2% were confirmed to have blood lead levels equal to or higher than 10 ug/dL, a decrease from 7.6% in 1997.¹²

Following this national trend, progress has also been made to lower the incidence of lead poisoning across Rhode

Island. Data show a steady declining trend in the state from 1997, when 9% of children under age six tested had confirmed elevated blood lead levels, to just 2% in 2006.¹³ Even with this decrease, Rhode Island still had the second highest rate of confirmed elevated blood lead levels (among 34 comparable states)¹⁴ and the highest rate in New England at 2% in 2006.¹⁵

Screening numbers report a similar story, dropping from 28% in 1995 to 5% in 2007.¹⁷ However, children in Rhode Island's urban areas are more likely to be affected by lead poisoning. For those tested, 5% of Rhode Island children who will be entering kindergarten in Fall 2009 screened positive for lead, but this includes 7% of children in core cities compared to 3% of children in the rest of the state.¹⁸ Specifically in Providence, 9% of tested children eligible for kindergarten in Fall 2009 screened positive, with 8% confirmed, the highest confirmed rate in Rhode Island. Blood lead levels may not be confirmed because children do not receive a second verification test—34 of 617 children statewide did not receive a needed second test.¹⁹

What did we report in 2004?

In 2000, 17% of children in Providence who were screened for lead poisoning tested positive for elevated blood lead levels (greater or equal to 10ug/dL). By 2003, this rate had dropped to 9% of those tested. This reported decline in the lead poisoning rate was consistent with decreases in lead poisoning observed in Providence since 1995, when 35% of all children under age six in the city tested positive for lead poisoning (see Table 1).

Between 2000 and 2003, rates of elevated blood lead levels decreased in all but one Providence neighborhood and two-thirds of neighborhoods experienced a decline of at least 50%. While these declines were impressive, lead poisoning remained concentrated in the neighborhoods with lowest incomes. Elevated blood lead level rates ranged from 2% in Blackstone and Wayland to 14% in Upper South Providence in 2003.

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What is happening now?

Local rates of lead poisoning continue to decline. In 2007, 7,318 Providence children under six years of age were screened for lead poisoning and 5% (or 347 children) had elevated blood lead levels (at or above 10 ug/dL). Rates varied across neighborhoods, with a low of 0% in Wayland to a high of 9% in Federal Hill (as shown in Table 1).

Citywide, childhood lead poisoning decreased 4 percentage points between 2003 and 2007 and an impressive 14 points since 2000, with every neighborhood in the city experiencing substantial declines in lead poisoning rates over the past decade. Some neighborhoods have seen sizable declines in just the past four years—for example, the rate

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in Lower South Providence declined from 12% in 2003 to 4% in 2007. This decline is even more impressive because in 1995, Lower South Providence had the highest rate of lead poisoning in the city with nearly one in two children under the age of six suffering from high levels of lead.

Table 1

Children Under Age 6 with Lead Poisoning as a Percent of those Screened, 1995-2007²⁰

	1995	2000	2003	2007
Blackstone	18%	6%	2%	3%
Charles	19%	11%	3%	3%
College Hill	22%	7%	9%	6%
Elmhurst	21%	6%	4%	2%
Elmwood	44%	22%	11%	5%
Federal Hill	40%	23%	13%	9%
Fox Point	30%	13%	11%	5%
Hartford	29%	11%	4%	3%
Hope	14%	7%	5%	3%
Lower South Providence	45%	27%	12%	4%
Manton	14%	11%	7%	2%
Mount Hope	32%	18%	10%	5%
Mount Pleasant	26%	13%	9%	4%
Olneyville	39%	19%	11%	8%
Reservoir	19%	22%	8%	2%
Silver Lake	35%	16%	7%	4%
Smith Hill	39%	18%	10%	6%
South Elmwood	40%	16%	8%	3%
Upper South Providence	38%	25%	14%	6%
Valley	38%	17%	11%	5%
Wanskuck	24%	17%	5%	3%
Washington Park	36%	19%	8%	4%
Wayland	18%	8%	2%	0%
West End	44%	21%	13%	7%
Citywide	35%	18%	9%	5%

Source: RI Department of Health Lead Poisoning Prevention Program.

The Downtown neighborhood is excluded from analysis because many Downtown addresses were the location of the regional office of the Department of Children, Youth, & Families and the actual addresses for the children were unknown. There were no cases of lead poisoning reported for Downtown in 2003 or 2007.

The 5% average in Providence is very close to meeting RI Department of Health's 2010 lead poisoning elimination goal of less than 5% for all communities statewide.²¹ When variations are examined geographically, ten of the city's 25 neighborhoods exceed this threshold. The neighborhoods with

the highest rates among children under six in 2007 were Federal Hill (9%), Olneyville (8%), and West End (7%). These neighborhoods have remained above the citywide average in lead poisoning but continue to make gains—in all three, lead poisoning rates have been cut more than 50% since 2000.

(Endnotes)

¹The effects of lead have been well-documented by many researchers. U.S. Environmental Protection Agency. (2008). *Lead in paint, dust, & soil: Basic information*. Available from <http://www.epa.gov/lead/pubs/leadinfo.htm>. ²Reyes, J. W. (2007, May). *Environmental policy as social policy? The impact of childhood lead exposure on crime*. (Working Paper 13097). Cambridge, MA: National Bureau of Economic Research. Retrieved September 8, 2008 from <http://www.nber.org/papers/w13097>. ³U.S. Environmental Protection Agency. (2008). *Lead in paint, dust, & soil: Basic information*. Available from <http://www.epa.gov/lead/pubs/leadinfo.htm>. ⁴Rhode Island KIDS COUNT. (2004). *Children with lead poisoning. 2004 Rhode Island Kids Count Factbook* (pp. 66). Providence, RI: Author. ⁵U.S. Environmental Protection Agency. (2008). *Lead and a healthy diet*. Retrieved August 18, 2008 from <http://www.epa.gov/lead/pubs/nutrition.pdf>. ⁶Hernberg, S. (2000). Lead poisoning in a historical perspective. *American Journal of Industrial Medicine*, 38. Wilmington, DE: Wiley-Liss, Inc. ⁷*Ibid*. ⁸Meyer, P.A., Pivetz, T., Dignam, T.A., Homa, D.M., Schoonover, J., & D. Brody. (September 12, 2003). Surveillance for elevated blood lead levels among children – United States, 1997-2001. *Morbidity and Mortality Weekly Report*, 52(SS10). Atlanta, GA: Centers for Disease Control and Prevention. Retrieved September 9, 2008 from <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5210a1.htm>. ⁹*Ibid*. ¹⁰Department of Health and Human Services Centers for Disease Control and Prevention. (2007). *Lead: CDC surveillance data, 1997-2006*. Available on the CDC website, <http://www/cdc.gov/nceh/lead/surv/stats.htm>. ¹¹*Ibid*. Most blood tests are capillary tests. Only one venous blood test is needed to indicate a confirmed elevated blood lead level. ¹²*Ibid*. ¹³Department of Health and Human Services Centers for Disease Control and Prevention. (2007). *Tested and confirmed elevated blood lead levels by state, year and blood lead level group for children <72 mos* [Data file]. Retrieved August 18, 2008 from <http://www.cdc.gov/nceh/lead/surv/stats.htm>. ¹⁴Rhode Island KIDS COUNT. (2008). *Children with lead poisoning. 2008 Rhode Island Kids Count Factbook*. (pp. 70-71). Providence, RI: Author. ¹⁵Department of Health and Human Services Centers for Disease Control and Prevention. (2007). *Tested and confirmed elevated blood lead levels by state, year and blood lead level group for children <72 mos* [Data file]. Retrieved August 18, 2008 from <http://www.cdc.gov/nceh/lead/surv/stats.htm>. Pennsylvania had the highest rate at 4.5% in 2006.

¹⁶Percentage of Children Under Age 6 in New England with Confirmed Elevated Blood Lead Levels, 1997-2006

Source: Centers for Disease Control and Prevention

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
RI	8.8	7.4	6.9	6.1	5.8	5.1	3.8	3.7	3.0	2.4
CT	1.3	4.0	3.3	3.7	3.0	2.6	2.3	2.2	1.9	1.7
MA	3.2	2.3	2.0	1.7	1.5	1.3	0.9	1.0	0.9	0.8
ME	4.0	4.0	3.5	3.3	2.9	2.0	1.7	1.5	2.0	1.8
NH	3.2	3.5	3.9	3.6	2.9	2.7	2.9	2.8	2.3	2.1
VT	4.5	3.8	2.8	2.8	2.2	2.2	1.9	1.7	1.3	1.2

¹⁷Annie E. Casey Foundation. (2006). Rhode Island children with elevated blood lead levels, 1995-2007. *CLIKS: Community-Level Information on Kids*. Available from http://www.kidscount.org/cgi-bin/cliks.cgi?action=graph_results&subset=RI&areaid=40&indicatorid=16. Rhode Island screening data for previous years are displayed below:

Percentage of Children in Rhode Island with Elevated Blood Lead Levels from Screenings by Year, 1995-2007

Source: Rhode Island KIDS COUNT

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
28.4	23.6	19.5	16.1	12.8	12.5	12.3	10.8	9.8	8.4	7.4	6.4	4.6

¹⁸Rhode Island KIDS COUNT. (2008). *Children with lead poisoning. 2008 Rhode Island Kids Count Factbook*. (pp. 70-71). Providence, RI: Author. Children with lead poisoning entering kindergarten in Fall 2009 includes 3-year-olds (born between 9.1.2003 and 8.31.2004) tested and screened positive for elevated blood lead levels at any point before 12.31.2007. ¹⁹*Ibid*. In Providence, 3,133 3-year-old children had been tested and 268 children screened positive, with 251 confirmed. ²⁰Analyses of Rhode Island Department of Health Lead Screening Data at different points in time is as follows: 1995: The Providence Plan. (2005). *Lead exposure. Providence neighborhood profiles*. Available from http://204.17.79.244/profiles/cw_lead.html. 2000: Ready to Learn Providence analysis of screening and blood lead level data from the Rhode Island Department of Health KIDSNET database. 2003: Ready to Learn Providence. (2004). *How Ready Is Providence?* (pp.64). Providence, RI: Author. 2007: The Providence Plan analysis of screening and blood lead level data from the Rhode Island Department of Health KIDSNET database. ²¹Rhode Island Department of Health. (2004, May). *Environmental quality. A healthier Rhode Island by 2010: A plan for action*. (pp. 28-31). Retrieved August 18, 2008 from <http://www.health.state.ri.us/hri2010/hri2010plan.pdf>. The Rhode Island elimination goal includes decreasing lead poisoning without displacing children, reducing screenings, or reducing available low-income housing. Rhode Island Department of Health Childhood Lead Poisoning Program. (2007, November). *Eliminating childhood lead poisoning in Rhode Island: Progress report*. Retrieved August 18, 2008 from <http://www.health.state.ri.us/lead/pdf/EliminationReport.pdf>.