

For Lead-Exposed Students, Early Intervention Can Reduce Harm to Their Learning

By [Sarah D. Sparks](#) — March 09, 2022

Children exposed to even low levels of lead can face academic and neurological problems in school. New research suggests early interventions can help a lot—but children whose problems don't develop immediately often lose out on critical support.

Research published this week in the [journal JAMA Pediatrics](#) finds children exposed to lead before age 3, who also received early intervention services, were 16 percent more likely to perform on grade level in English/language arts, and 14 percent more likely to perform on grade level in math in 3rd grade, compared to lead-exposed children who did not have early interventions.

While the findings show promise, the problem is that interventions often begin later than that. “The [early intervention] system operates from a deficit-driven model, meaning that services are provided to children based on the presence of delays,” some of the study authors write in a separate [article commenting on the Pediatrics study](#). “Many children with a history of low-level lead poisoning do not experience notable delays in early childhood; low levels of lead exposure result in executive-functioning deficits and learning challenges that often present in school-age children after the critical window of [early intervention] opportunity has passed.”

The American Academy of Pediatrics recommends children have blood-lead levels of no more than 1 part per billion or ppb, but “all the studies that are out now suggest there is no safe level of lead,” said Jeanette Stingone, a co-author of the study and an assistant professor of epidemiology at the Columbia University Mailman School of Public Health. “At any point that you measure, you see some detriment [from exposure], but obviously ... under age 3, is a time where our brain is rapidly developing. These windows are very vulnerable, probably more vulnerable than if you're 15 or 16 and being exposed to lead.”

Researchers analyzed data on more than 11,000 New York City children who had blood-lead levels of at least 4 ppb before age 3. They compared the academic progress of more than 2,700 of these children who received early intervention services for lead exposure against that of a matched group of more than 8,100 lead-exposed children who did not get services.

Early intervention services included occupational, physical, and speech therapies as well as special instruction, but the study did not dig into whether any one or combination of those services was more effective for lead-exposed toddlers.

“There should be communication between schools and [early-childhood organizations] as kids age out of early intervention and then age into public school,” she said. “Making sure that that communication is happening, I think, is key so that there's a continuity of services when they're needed.”

Since 1993, all children in New York have been screened for lead, but until recently (and during the study) a child was referred for evaluation only if their lead levels topped 15 ppb. (The state has since lowered the cutoff to 5 ppb.)

However, the study found significantly more students were exposed to damaging levels of lead than get supports to help them overcome any neurological or cognitive problems that result. For example, both the current and previous studies have found that while there are no differences in lead exposure rates between boys and girls, neurological and developmental delays tend to be spotted sooner in boys, and they are more likely than girls to be referred for intervention services related to lead exposure.

Stopping later school lead exposure

As of 2019, 22 out of 37 states studied got a failing grade on efforts to reduce children's lead exposure in schools and communities, according to a [report on states' lead policies](#) by the U.S. Public Interest Research Group Education Fund and the Environment America Research & Policy Center. Since then, Washington, Maryland, Montana, and New York have all lowered their lead-exposure limits to 5 ppb. State legislatures in Florida, Massachusetts, and Michigan also have bills which would require schools to use lead filters for water supplies, but it is not clear how many of these will become law.

Since then, more states have taken "incremental steps" toward better identifying and supporting children who have been exposed to lead, according to John Rumpler, the clean water program director for Environment America, and co-author of the 2019 "[Get the Lead Out](#)" report.

A few individual districts have also worked to provide more-comprehensive screening and prevention. For example, [Portland, Ore., public schools](#) are implementing a pilot program to provide all schools with lead filters and filtered drinking-water stations, with a goal toward reducing lead exposure to 1 ppb.

A [lead and copper exposure rule](#) passed under the Trump administration requires all schools to take at least five samples from different water outlets in every school over the next five years, but, "the biggest problem is that [site-based] lead testing is highly variable," Rumpler said. "You can find no lead, no lead, no lead, and then boom, a big slug of lead."

He recommended that schools and districts assume they have at least some contamination in their buildings and community, and focus on prevention for structures and interventions for lead-exposed students. He noted that even states like New York, which require lead-exposure screening for infants and toddlers, generally don't continue periodic lead screenings once children reach school age. That means children who fall through early screening cracks or who are exposed to lead later on may never receive support services.



[Sarah D. Sparks](#)

Sarah D. Sparks covers education research, data, and the science of learning for Education Week.