

Preventing Childhood Lead Exposure in Pennsylvania

Lead remediation can help prevent future crime



Acknowledgements

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A photograph of a baby crawling on a wooden floor. The baby is looking towards the camera with a happy expression. The background is slightly blurred, showing what appears to be a staircase.

5,000
young children in
Pennsylvania suffer
from lead poisoning
each year.

Summary

In Pennsylvania, there were nearly 5,000 young children under age 6 with confirmed elevated blood lead levels in 2021. Another nearly 2,000 children had initial elevated blood lead levels without a second confirming test.¹ Elevated lead levels can lead to multiple health issues, both in childhood and later in life, potentially increasing children's risk of future crime. By implementing lead remediation practices and investing in children's health now, we can prevent Pennsylvania's children from being exposed to lead and ensure that they are less likely to be involved in the justice system later in life.

Lead exposure alone has not been found to be a sole contributor to future criminal activity or involvement in the justice system. However, there is ample evidence to suggest that it can put children at higher risk of future crime, along with other factors such as living in poverty.

Introduction

Researchers estimate that approximately 500,000 young children in the United States have elevated levels of lead in their blood. The Centers for Disease Control and Prevention now defines an elevated lead level for children as 3.5 micrograms of lead per deciliter of blood, down from the previous threshold of 5.0 micrograms per deciliter.² This level was subsequently adopted by the Pennsylvania Department of Health in January 2022.³ Children can be exposed to lead through inhaling or ingesting lead dust, drinking water from lead pipes, or consuming paint chips or soil that contain lead.⁴ Lead exposure can occur in homes, schools, or child care facilities.⁵

Residential homes built prior to 1950 have the highest risk of containing lead-based paint.⁶ In Pennsylvania, the main source of lead poisoning is lead-based paint. The state did not ban this paint for residential use until 1978, and Pennsylvania ranks fifth



in the country for old housing, with 70 percent of residential units having been built prior to 1980.⁷ This high potential for lead exposure has a significant impact on the children in our state, and disproportionately impacts children of color and those in low-income families.⁸ Lead remediation measures must be implemented in order to allow all Pennsylvania's children to grow up in safe and healthy environments, and to help avoid future crime.

Risks of lead exposure

Lead exposure, especially among young children, can have lasting negative impacts. Children are more at-risk than adults, because children's bodies absorb more lead and their brains and nervous systems are more susceptible to damage from elevated lead levels. The symptoms of lead exposure range from hearing problems and headaches to slowed growth, learning difficulties, behavior problems, and damage to the nervous system and brain.⁹ While the severity of these symptoms depends on the level of lead in a child's blood, there is no safe level of lead exposure in children.¹⁰

Testing for lead poisoning in Pennsylvania

As of 2019, Pennsylvania had the second-highest number of children who tested positive for lead poisoning in the United States. Of the 10 states with the highest

rates of elevated lead levels, Pennsylvania ranked second-worst for testing children.¹¹ The latest 2021 data available from the Pennsylvania Department of Health shows that nearly 5,000 children birth to under 6 years old had confirmed elevated blood lead levels. Another nearly 2,000 children had initial elevated blood lead levels without a second confirming test. The actual numbers are likely to be significantly higher because parents continued to take COVID precautions in 2021 and because only 18.7 percent of children birth to age 6 had their blood lead levels tested. For children 23 months and younger, only 32.9 percent were tested in 2021.¹²

Childhood lead exposure increases the risk of future crime

Research suggests that lead exposure in childhood can lead to future learning disabilities, behavior issues, and problems with impulse control.¹³ These issues can lead to crime in adulthood, making lead exposure prevention a priority for law enforcement.

Lead exposure can occur even before a child is born. Children who experience prenatal exposure to lead committed an average of two more delinquent acts as adolescents than children not exposed to lead. Additionally, children who were exposed to lead in early childhood committed, on average, nearly five more

delinquent acts as adolescents than their peers who were not exposed to lead.¹⁴ A longitudinal study of the relationship between lead exposure and crime found that populations that had lead in their drinking water had higher homicide rates after 20 years, compared to areas where lead was not present in drinking water.¹⁵

One study found that, as blood lead levels increased, so did the risk of being arrested for a violent crime in young adulthood. For every five micrograms per deciliter increase in the level of lead in a child's blood at age 6, their likelihood of being arrested for violent crime as young adults increased by almost half.¹⁶ A longitudinal study on the effects of lead exposure in the first six years of life found that exposure was predictive of future juvenile delinquency and arrests between the ages of 18 and 33. The study also found that lead ingested in early life remained detectable by blood tests through the third decade of life.¹⁷

Another study linked preschool blood lead levels with data on detention rates for 120,000 children born in Rhode Island between 1990 and 2004. The researchers found that, as lead levels in the soil surrounding children's homes increased, so did rates of suspension from school and juvenile incarceration. Rates of suspension were estimated to increase by as much as seven percent for boys, and nine percent for girls. This study also controlled for income, reducing the likelihood that these increases were caused by living in a low-income home.¹⁸

Other consequences of lead exposure

Lead poisoning can impair school readiness. A panel study, assessing whether differences in exposure to neurotoxic lead explain sociodemographic

gaps in school readiness, found that lead contamination explains 15–25 percent of disparities in vocabulary skills and 33–66 percent of the disparities in attention problems at ages 4 and 5.¹⁹ Lead poisoning can also lead to poor school performance. One study found that after adjusting for other predictors of school performance, including poverty, higher levels of lead in the blood were associated with lower reading and math scores in third grade children. For every increase of five micrograms of lead per deciliter of blood, a student's risk of failing math or reading increased by as much as 32 percent.²⁰

In addition to the negative impacts on learning, lead exposure can be costly. The estimated total cost of the lifetime economic burden of childhood lead exposure in Pennsylvania is \$3.1 billion. This figure was calculated for the 2019 birth cohort, and includes the costs of increased health care, increased spending on education, reduced lifetime productivity, and premature mortality. Additionally, the direct costs of crime due to lead exposure nationally is estimated to be over \$1.7 billion.²¹ Experts predicted that over 15,000 children in Pennsylvania (11 percent of all births in the state) have elevated levels of lead in their blood in 2019.²²

Successes and areas for future progress

While lead poisoning is a significant challenge for the health and safety of children in Pennsylvania, it is entirely preventable. Thanks to efforts to reduce lead exposure, the state has made progress in protecting children from lead's damaging effects. Between the 1970s and 1990s, eliminating lead from gasoline, banning lead paint in residential homes, and banning lead pipes and plumbing fixtures saw significant declines in blood lead levels in



children. However, lead poisoning still occurs, particularly among families with low incomes, because they are more likely to live in older properties with deteriorated lead-based paint.²³

Pennsylvania is taking steps to prevent future lead exposure in children. In 2019, the Commonwealth received a \$2.5 million federal Housing and Urban Development

(HUD) grant to evaluate homes in the state. The grant is designed to target outreach to homes with the highest need in order to reduce lead exposure in children.²⁴ Through funding received from the federal American Rescue Plan Act in 2022, the Pennsylvania Department of Health is dispersing \$8 million to over 20 current US HUD lead hazard reduction programs statewide to remove lead paint from homes. While progress is being made, more must be done to protect Pennsylvania's children from the harmful effects of lead.

In November 2022, a childhood blood lead level testing bill became law (Act 150 of 2022). It directs health care providers to consider performing blood lead testing if risk factors warrant. It is important that the General Assembly strengthen this law by passing pending legislation that would require at least one blood lead level test of young children (with a parental opt-out provision) in order to mitigate health impacts and to help make dwelling units safer for children in known hazardous environments.

Conclusion

Lead poisoning is completely preventable. The primary way to prevent children from being exposed to lead is to eliminate lead hazards in homes and other buildings where children live and play. We urge Pennsylvania policymakers to create a new "End Childhood Lead Poisoning Fund" and sustain it with ongoing appropriations to support homeowners and landlords who cannot afford to remediate lead hazards. Additionally, we support establishing a state tax credit to incentivize property owners to make their homes and apartments lead safe. Every dollar spent on removing lead paint-based hazards results in a return of three dollars in the form of avoided health care costs and loss of lifetime earnings.²⁵ Additionally, lead remediation investments help reduce future criminal activity.²⁶ By getting as many young children as possible tested for lead exposure and by investing in residential lead remediation now, Pennsylvania can protect children not only from the lifelong health impacts of lead exposure, but also from potential future crime.

Endnotes

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