

Importance of Lead Level Testing in Worcester Head Start

Jeanette Beaute, Jaclyn Daigneault, Ailish Hanly, Alanna Hickey, Tharakeswari Selvakumar
Population Health Clerkship
University of Massachusetts Medical School



Worcester Head Start

- Head Start is a federally funded preschool program that provides comprehensive services to children and families.
- Children are eligible if they live in the city of Worcester, are 3 or 4 years of age, and are from a low-income family.
- The program promotes education, health, family involvement, and preparation for kindergarten.

Background

- Lead is a metal that is toxic to humans, both acutely and chronically.
- Lead was removed from gasoline and paint in the 1970s, yet ingestion of paint chips and dust continues to be the primary source of lead poisoning in children.
- Primary prevention focuses on removal of lead from the environment, secondary prevention includes early detection of high lead levels, and tertiary prevention involves reducing morbidity in an exposed individual.
- Children younger than six are most susceptible due to their incomplete blood-brain barrier and lower iron levels.
- Lead toxicity damages the nervous system, heme synthesis pathway, and kidneys. Other general symptoms of lead toxicity include vomiting, abdominal pain, and fatigue.
- Since children are initially asymptomatic, diagnosis is made by an elevated blood lead level (BLL).
- The toxic BLL in the U.S has been set to ≥ 5 mcg/dL.
- Chelation therapy may be indicated in symptomatic toxicity or BLLs over 45 mcg/dL, however it has limited efficacy and cannot correct the irreversible cognitive and behavioral effects of lead.
- Because of limitations in treatment, primary and tertiary prevention are essential to management.

Objectives

- To evaluate rates of elevated blood lead levels in children enrolled in the Worcester Head Start program and compare them to statewide Head Start data
- To assist school nurses in their efforts to educate parents about the importance of lead testing in children

Worcester Head Start Population

Family Services

	Number of families (N=632)
Receiving cash benefits or other services under the Federal Temporary Assistance for Needy Families (TANF) Program	57 (9.02%)
Receiving Supplemental Security Income (SSI)	462 (73.10%)

Student Health

	Number of students (N=671)
Have health insurance*	671 (100%)
Have a medical home*	671 (100%)
Have up-to-date immunizations or exempt*	671 (100%)

* By the end of the school year

Lead Data

Massachusetts-Wide Data:

- Information was obtained from the Massachusetts (MA) Department of Public Health Lead Prevention Program
- A risk score is calculated from each MA community that takes into account the incidence rate of elevated cases, the percentage of families living below 200% of their poverty threshold, and percentage of housing built before 1978

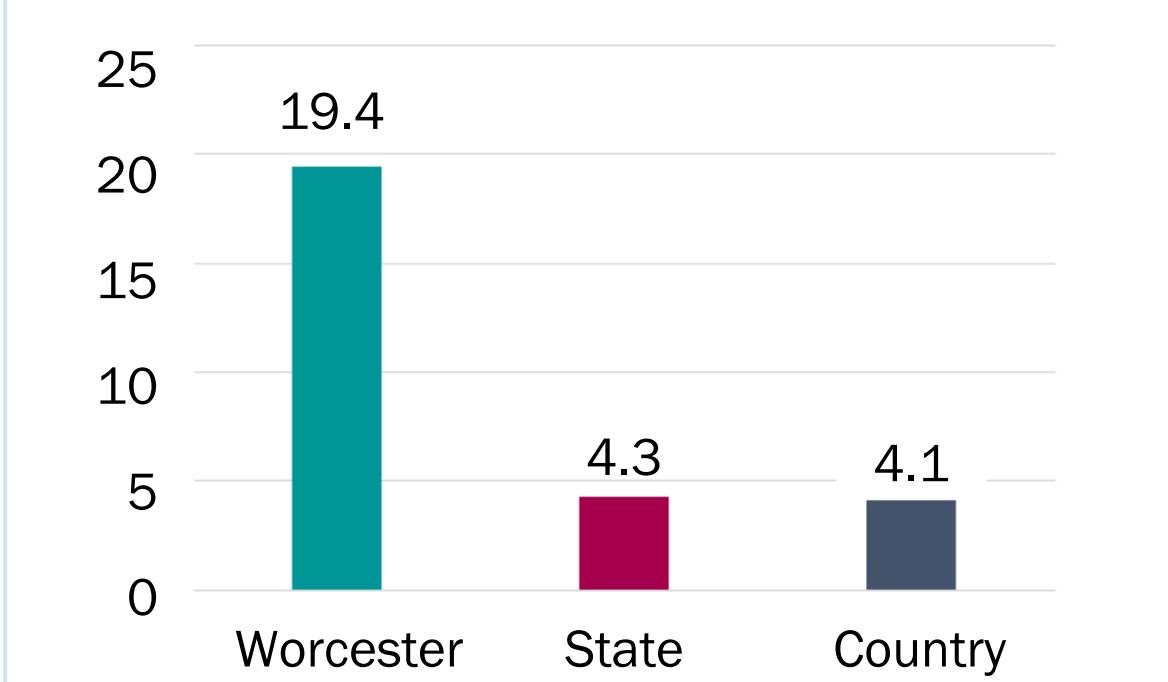
Head Start Specific Data:

- Data compiled by the nursing staff tracks the students' screenings, immunizations, and health outcomes
- All students are required to have lead levels checked yearly in order to be eligible for the program

Worcester's Relative Risk

	Worcester	State
Risk Score	7.2	2.8
Screening Rate	74%	76%
Incident Rate (per 1000 children)	3.7	2.8
Homes built before 1978	79%	71%

Head Start children receiving medical treatment for high lead levels (per 1000)



Service Project

- A notable challenge faced by Head start is ensuring that children complete yearly blood lead level testing, a requirement for entry into the program.
- Nurses report that parents may not completely appreciate the necessity of lead testing, and thus do not advocate for lead testing during their child's school physical.
- Based on this, and the increased lead levels in the Worcester community reported here, we want to offer a resource for families to help facilitate education about lead.
- We created an informational pamphlet containing material about lead acquisition and testing, the significance of elevated lead levels and treatment, as well as additional resources, to distribute to parents of Head Start.

Conclusions

- Compared to statewide Head Start, Worcester Head Start has a higher lead risk score, incident rate, and percentage of homes built before 1978.
- The screening rate within Worcester Head Start is 2% lower than the statewide screening rate.
- The percentage of children treated for high lead levels was higher in Worcester Head Start than in both state and national Head Start.
- Further analyses would be needed to determine if these are statistically significant differences.

References

- "Worcester Child Development Head Start" brochure
- Lowry, Jennifer (2017). Childhood lead poisoning. J. F. Wiley, ed. UpToDate Inc. <http://www.uptodate.com> (Accessed on October 23, 2017.)
- Massachusetts Department of Public Health. (2017). *High Risk Communities for Childhood Lead Poisoning*. Retrieved from <https://www.mass.gov/lists/view-lead-statistics-in-your-community>
- Office of Head Start - Program Information Report. (2016). *Health Services Report - 2016*.

Acknowledgements

A very special thank you to Leanne Winchester, Kimberly Gallagher, Brenda Pike, Carol Rioux, Lisa Klatt, MaryAnn Rollins, and Worcester Head Start