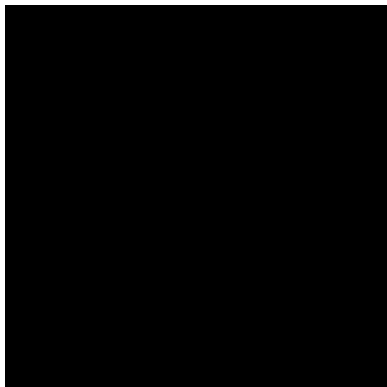


Blood Lead Levels Among Oregon American Indian and Alaska Native Children



Northwest Portland Area
Indian Health Board

Indian Leadership for Indian Health

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Lead exposure in children can lead to permanent long-range health problems including speech delays, impulsivity, poor attention span and organization skills, and decreased intelligence¹. Recent studies have found that, while levels above 10 µg/dL are considered elevated, there is no safe level of lead in children, and even levels below 10 µg/dL have been associated with decreased IQ later in life². Risk factors include the age of the child's housing, renovation or remodeling of old homes, parental occupations involving lead exposure, children observed eating paint chips or showing signs of pica, and lower socioeconomic and educational status³.

Background

Universal testing for elevated blood lead levels (EBLL) was recommended by the CDC in 1991; however, that recommendation was recalled in 1997 due to decreasing rates of EBLL and large regional differences. Rather, states were recommended to form advisory committees and determine a lead screening or surveillance system that worked best for their region.

In Oregon, labs and medical providers that perform blood lead testing on children must report the results to the Oregon Health Authority. Because screening is not universal, screening rates in Oregon are low, with only about 2.3% of children under six years old tested⁴. It is not clear how providers choose which children to screen, but children who have risk factors for lead exposure are probably selected for screening more often; thus, the state registry is unlikely to be representative of all children in the state. However, it may be useful in identifying trends and differences between groups.

Dataset and Linkage

Data presented in this report are drawn from the Oregon Childhood Blood Lead Test Registry which includes all children tested in Oregon from the 2005 to 2010, a total of 78,730 children. The ages of children tested ranged from less than one year old to 18; 87.6% of the tests were done on children under age six.

The original dataset included 1,257 children classified as AI/AN. The Lead Test Registry was matched to the Northwest Tribal Registry (a list of AI/AN patients registered at IHS and tribal clinics in the Northwest) to increase the identification of AI/AN children. The linkage identified an additional 461 children as AI/AN, for

¹Centers for Disease Control and Prevention. Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention. Atlanta: CDC; 2002

²Canfield RL, Henderson CR, Cory-Slechta DA, et al. Intellectual Impairment in Children with Blood Lead Concentration below 10 µg per Deciliter. *New England Journal of Medicine* 2003;348:1517-25

³Washington State Childhood Blood Lead Screening Recommendations; Washington State DOH Office of Epidemiology. November 2000. <http://www.doh.wa.gov/ehp/lead/pdfs/WALeasScreenRecommend.pdf>

⁴CDC data 2005-2008, <http://www.cdc.gov/nceh/lead/data/state/ordata.htm>



a total of 1,718 children in the Oregon Lead Test Registry. About 27% of the AI/AN children were racially misclassified or missing race information in the state registry. The majority of these were missing all race information (85%).

After correcting the race data based on the linkage information, the proportion of AI/AN children in the Lead Test Registry increased from 1.6 to 2.2%. It should be noted that race data was missing for the majority of the cases in the Oregon Childhood Blood Lead Test Registry (67.0%).

Analysis

In cases where one child had multiple lead tests, only the earliest test was retained for most analyses. Some analyses were restricted to confirmed elevated cases, and to one test per year per child. Because capillary blood lead screening carries the risk of false positive results, confirmatory tests by venous sampling are often completed following an elevated capillary result.

Results

Approximately 2.9% of Oregon's AI/AN children under age 6 were tested between 2005 and 2010 (Table 1). This proportion is slightly higher than the percent of all children tested (2.3%), but lower than the proportion of black children (3.8%). Blood lead testing was equally common among AI/AN boys (49.2%) and girls (49.6%).

The average blood lead level for all AI/AN children was 1.07 µg/dL, lower than the overall state average of 1.33 µg/dL (Table 2). This is also lower than the US national average of 1.49 µg/dL⁵. American Indian/

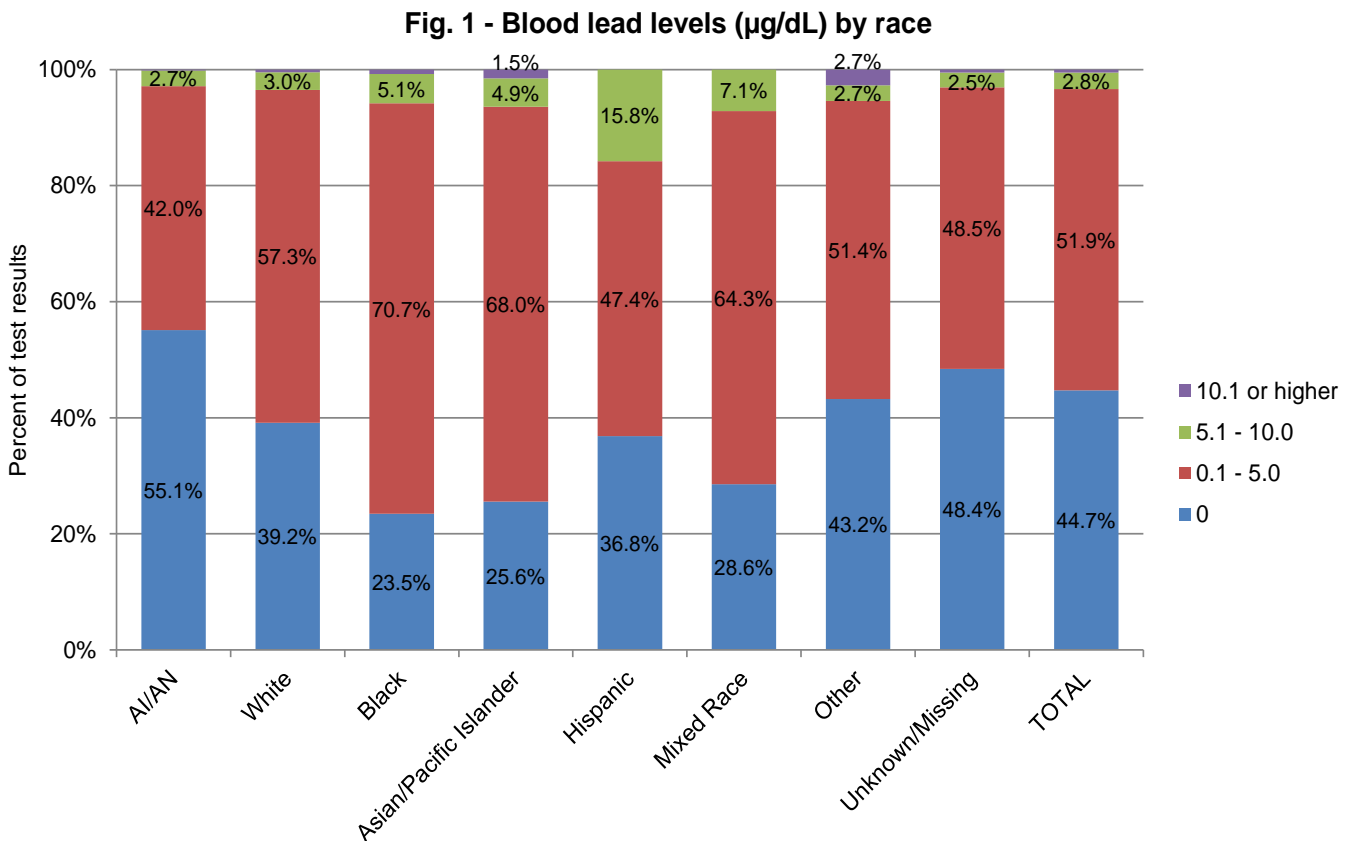
| | Table 1. Number and percent of children tested by year and race, ages 0-5 | | | | | | | |
|--------------|---|------------|----------|------------|----------|------------|------------------------|------------|
| | AI/AN | | White | | Black | | Asian/Pacific Islander | |
| | # Tested | % of State | # Tested | % of State | # Tested | % of State | # Tested | % of State |
| 2005 | 223 | 3.2% | 2382 | 1.0% | 476 | 4.7% | 184 | 1.3% |
| 2006 | 201 | 2.8% | 2511 | 1.0% | 444 | 4.2% | 218 | 1.5% |
| 2007 | 151 | 2.0% | 1513 | 0.6% | 383 | 3.5% | 226 | 1.5% |
| 2008 | 124 | 1.6% | 2354 | 0.9% | 401 | 3.5% | 229 | 1.5% |
| 2009 | 391 | 5.0% | 4087 | 1.6% | 438 | 3.6% | 249 | 1.6% |
| Total | 1090 | 2.9% | 12847 | 1.0% | 2142 | 3.8% | 1106 | 1.5% |

⁵ CDC –National Health and Nutrition Examination Survey (NHANES) data 2005-2009, accessed 2009



Alaska Native children had the highest proportion of negative test results (0 $\mu\text{g}/\text{dL}$) compared to children of other races/ethnicities (Figure 1). Fewer than 3% of AI/AN tests were in the range of 5.1 – 10 $\mu\text{g}/\text{dL}$, and a very small percentage were considered “elevated”, over 10 $\mu\text{g}/\text{dL}$.

| RACE | N | Mean | Std Dev | Minimum | Maximum |
|-------------------------------|--------------|-------------|----------------|----------------|----------------|
| AI/AN | 1718 | 1.07 | 1.73 | 0 | 20 |
| White | 19702 | 1.43 | 2.05 | 0 | 72 |
| Black | 3159 | 2.02 | 2.12 | 0 | 24 |
| Asian/Pacific Islander | 1718 | 2.11 | 3.14 | 0 | 46 |
| Hispanic | 19 | 2.74 | 3.03 | 0 | 10 |
| Mixed Race | 14 | 1.79 | 2.15 | 0 | 8 |
| Other | 37 | 1.73 | 2.43 | 0 | 12 |
| Unknown/Missing | 52362 | 1.23 | 2.05 | 0 | 65 |
| TOTAL | 78729 | 1.33 | 2.09 | 0 | 72 |





Across the whole state, less than half of one percent of AI/AN children had a confirmed blood lead level over 10 $\mu\text{g}/\text{dL}$ (actual numbers too small to report). This proportion was similar to children of other races. Among AI/ANs, most of the confirmed elevated results were among children living in the greater Portland area.

Limitations

These data represent Oregon children who were screened for lead poisoning between 2005 and 2010, which comprised only a very small percentage of the statewide population (less than 3%). The data are likely not generalizable to the whole population, because children with risk factors such as older housing or low socioeconomic status may be more likely to get screened through WIC or other community outreach programs. Alternatively, children at higher risk of lead poisoning may lack the resources to get screened, so the data may more closely represent those at low risk. It is unclear how providers or parents choose which children to screen for lead poisoning.

Although the Oregon Childhood Blood Lead Test Registry does collect race data from lab forms or medical records, as well as linking with Medicaid data to improve race information, race data is often missing and may be inaccurate. The linkage with the Northwest Tribal Registry helped lessen this problem for AI/AN children in the Lead Registry, but a substantial percent of missing race data still existed following the data match (66.5% of post-linkage records). Thus, race-specific results are incomplete and may not be generalizable to the broader population.

Summary

Overall, this analysis shows that AI/AN children were tested for blood lead poisoning at similar rates to children of other races across Oregon. There was no disparity demonstrated in blood lead levels for AI/AN children; in fact, AI/ANs had lower average lead levels and a higher proportion of undetectable levels, compared to children of other races/ethnicities.

Resources

If you suspect you or your children may be exposed to lead, call the toll-free statewide LeadLine at 1-800-368-5060 for information and referral to organizations that can help minimize your family's lead exposure. Referral to free screening services may also be available.

Additional resources may be found online:

<http://web.multco.us/health/getting-your-child-tested-lead>

<http://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/HealthyHomes/LeadPoisoning/Pages/index.aspx>



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