Data Notes for Lead Exposure Risk on the Information by Location (IBL) Tool

Data and Sources

After reviewing a large number of possible geospatial risk factors for estimating geographic lead exposure risk only two were appropriate for use in Washington State: Lead risk from age of housing and poverty. These two risk factors were identified by the Washington State Department of Health and were reviewed by a multi-stakeholder expert panel. Although there are other risk factors for lead exposure such as having a sibling or playmate with an elevated blood lead level or parents who work in an industry where lead is used, we did not have sufficiently high-quality data to account for these variables in the tool.

Age of housing – data on housing age comes from the U.S. Census's American Community Survey's 5-year rollup. This dataset provides the total number of houses and proportion of houses by year of construction. We used this data in conjunction with national estimates of the proportion of housing from each era with lead risks.[i] Here is an example of how lead risk from age of housing was calculated for a fictitious census tract:

Example calculation of lead risk from age of housing using a fictitious census tract:

	Construction Year	Number of Houses	Percent with Lead Hazards	Estimate of homes with a lead risk
	After 1980	100	0	0
	1960-1979	100	8%	8
	1940-1959	100	43%	43
	Before 1940	100	68%	68
Total		400		119
	Proportion of homes with a lead risk:		119/400	**29.8%**

Poverty – There is a significant association between poverty and elevated blood lead levels.[ii] Children who live below the poverty line and live in pre-1950 housing are at the greatest risk for lead exposure because the home is more likely to have aging lead paint that is in poor condition.[iii]

Weighting

IBL combines age of housing and poverty into a single geographic risk layer and classifies census tracts into deciles. A decile is a group that represents one tenth of the whole. IBL allows us to weight risk factors to best approximate the amount of risk attributable to the indicator. The weights were calculated using data from the National Health and Nutrition Examination Survey

reported in CDC's 2013 MMWR "Blood Lead Levels in Children Aged 1-5 Years – United States 1990-2010".

Weighting Risk Factors in the Lead Risk Map:

Poverty	Mean BLL	
<1.3	4.4	µg/dL
≥1.3	1.2	µg/dL
Difference	3.2	

	Change in BLL	**Final Weight**
Poverty	3.2 µg/dL	**42%**
Age of Housing	4.5 µg/dL	**58%**

Age of Housing		
Pre-1950	5.3	µg/dL
1950-1977	1.3	µg/dL
Difference	4.0	µg/dL

4.0	µg/dL	
4.9	µg/dL	
Mean	4.5	µg/dL

Pre-1950	5.3	µg/dL
1978 or later	0.4	µg/dL
Difference	4.9	µg/dL

Caveats

The rankings help to compare health and social factors that may contribute to disparities in a community. You should not interpret rankings as absolute values. Do not use them to diagnose a community health issue or to label a community.

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[i] Jacobs, D. E., Clickner, R. P., Zhou, J. Y., Viet, S. M., Marker, D. A., Rogers, J. W., Friedman, W. (2002). The prevalence of lead-based paint hazards in US housing. *Environmental Health Perspectives*, *110*(10), A599.

[ii] Centers for Disease Control and Prevention (CDC. (2013). Blood lead levels in children aged 1-5 years-United States, 1999-2010. *MMWR. Morbidity and mortality weekly report*, *62*(13), 245.

[iii] Pirkle, J. L., Kaufmann, R. B., Brody, D. J., Hickman, T., Gunter, E. W., & Paschal, D. C. (1998). Exposure of the US population to lead, 1991-1994.*Environmental health perspectives*, *106*(11), 745.