

## TITLE

Lead and Children—A look at Childhood Blood Lead Levels in Oklahoma, 1995–2003

## THEME

Advance Environmental Public Health Science and Research

## KEYWORDS

lead, lead poisoning, health effects, environmental hazards, epidemiology, linking, mapping

## BACKGROUND

Childhood lead poisoning (CLP) remains a serious and preventable environmental health issue. About one million children 6 years or younger in the U.S. have blood lead levels (BLL) of at least 10mg/dL, a level high enough to adversely affect their intelligence, behavior and development. Nearly all CLP cases were attributed to some environmental exposure. This presentation examines spatial relationships between the homes of children with elevated BLL and potential environmental lead hazards in Oklahoma.

## OBJECTIVE(S)

To determine relationships between childhood blood lead levels and environmental lead hazards.

## METHOD(S)

Data for this project was gathered for the Oklahoma Public Health Environmental Tracking System (OK-PHETS), a joint project between the Oklahoma State Department of Health (OSDH) and the Oklahoma Department of Environmental Quality (DEQ). Using Geographic Information Systems and SaTScan spatial cluster analysis software, researchers analyzed and mapped the home locations of children tested for lead poisoning from the Oklahoma Childhood Lead Poisoning Prevention Program database. The locations of environmental lead hazards such as Superfund sites, Toxic Release Inventory sites, and Air Emission Inventory sites were also mapped. Visual and statistical analysis was conducted to determine environmental lead hazard relationships with childhood blood lead levels.

## RESULT(S)

From 1995–2003, annual elevated blood lead cases have declined while the number of children tested has increased. Elevated blood lead level rates are highest among children between 12 to 23 months of age, which is the age most children become mobile. Childhood blood lead levels are slightly higher in areas within 3 miles of environmental lead hazards, although these levels are much lower than the level health officials consider a threat.

## DISCUSSION/RECOMMENDATION(S)

While there is evidence that supports a relationship between childhood blood lead levels and environmental lead hazards, environmental lead hazards do not completely explain childhood lead poisoning. Lead exposure from housing built

before 1978 is still seen as the greatest lead poisoning threat for children. Further research needs to be done to support this theory. Childhood lead poisoning seemed to cluster in Northeast, South-Central, and Southwest Oklahoma.

Lead is a well-known pollutant and has been studied a great deal. Environmental lead hazards are a danger to children, but lead in housing built before 1978 may be a much greater danger to children. However, individual housing data is very difficult to obtain. Also, drinking water data is difficult to link to end-users. The OK-PHETS program is in the process of acquiring housing data from county assessors' databases to improve the quality of housing data. If completed, this analysis will be included in this presentation.

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