



Healthy Environments for Children Alliance

A world-wide alliance to reduce environmental risks to children's health that arise from the settings where they live, learn, play, and sometimes work by providing knowledge, increasing political will, mobilizing resources, and catalyzing intense and urgent action.

Issue Brief Series: Lead

Lead is a naturally occurring metal, found throughout the environment. High levels of lead have entered the environment through human activities such as mining, industrial processes and burning fuels. Lead is used in hundreds of products, for example as an additive in gasoline, in the production of batteries, as an additive in some paints, in solder, in making stained glass and crystal, for ammunition, in ceramic glazes, and in some cosmetics and traditional medicines. Drinking water delivered through lead pipes or pipes joined with lead solder may contain lead.

Lead poisoning is a serious child health concern throughout the world. Children are most likely to be exposed to lead from automobile fumes, where leaded gasoline is still used, and from ingestion of flakes and dust from decaying lead-based paint. This affects children's brain development and their measurable level of intelligence (IQ).

After it enters the body, lead is distributed to organs such as the kidneys, liver, and bones. The body stores lead in the teeth and bones where it accumulates over time. Undernourished children are more susceptible to lead because their bodies absorb more lead if other nutrients, such as calcium, are lacking.

Highest risk children are the very young (including fetuses) and the impoverished. There is no known safe blood lead level but it is known that, as lead exposure increases, the range and severity of symptoms and effects also increases. Even blood lead levels that are around 10 ug/dl, once thought to be a "safe level," may lead to decreased intelligence in children, behavioral difficulties and learning problems. Other central nervous system functions (CNS) are suspected of being affected by slight lead elevations and are under research.

Higher blood lead levels can result in CNS effects, reduced IQ, impaired growth, harm to the kidneys and other organs, and compromise red blood cell development. Acute lead poisoning can eventually result in convulsions, coma and sometimes death. Lead absorbed by the fetus can cause miscarriage, premature birth or low birth-weight.



... a Global Concern

- Despite global calls to eliminate lead from gasoline, a number of countries, primarily in the Eastern Mediterranean and African regions, still use lead to boost octane levels.
- About one-fifth of the burden of disease from lead occurs in the Southeast Asian region, with another one-fifth of the burden of disease taking place in the Western Pacific region.
- All but two countries in Latin America and the Caribbean region have eliminated lead from gasoline. Lead exposure from cottage industries is a growing concern, with some studies underway in the U.S.-Mexico border region concerning battery recycling plants and ceramic artisans.
- In Europe, WHO estimates that nearly 157 thousand days of healthy life are lost in children under four years of age due to mild retardation from lead poisoning.

Acting to safeguard children's environments can save millions of lives, reduce disease and provide a safer, healthier world for our children's future.

See the *Healthy Environments for Children Alliance Framework for Action*

Children's Vulnerability to Lead

Behavioral: Young children explore their surroundings by putting hands and other objects in their mouths, a primary route of lead exposure. Because the very young crawl and play on the floor, they are directly exposed to the areas where lead dust most heavily accumulates. Children with pica, a tendency to eat non-food items, are particularly vulnerable to lead poisoning, as they will likely ingest lead if it is in paint chips, soil or other items the child eats.

Physiological: Relative to their size, children breathe more air, consume more food, and drink more water than adults. Lead found in air, water or food will therefore expose children more than adults. Added to that, children's bodies absorb greater proportions of lead than adult bodies. A toddler will absorb about 50% of ingested lead, whereas an adult will absorb about 10%. Children's brains and nervous systems are also more sensitive to the damaging effects of lead and may not be able to repair the damage caused. Children's organs are under development from the fetal stage through adolescence. During his or her first years of life, a child's ability to metabolize, detoxify, and excrete toxins differs from that of an adult, making the child more susceptible to lead.

Developmental: Children have their whole lives ahead of them to develop health effects from lead exposure and to suffer the consequences of lead poisoning from their early years. In addition, children's systems can be permanently damaged if exposed to toxins such as lead during certain crucial periods of development.

Actions at Every Level Make a Difference

Many countries around the world have successfully introduced fuel policy changes, now consuming solely unleaded gasoline. In 2002, the World Summit on Sustainable Development called for the global removal of lead from gasoline. The World Bank continues working with countries to reformulate gasoline and eliminate lead additives. National clean air policies with strong enforcement mechanisms, particularly with regard to industrial sources, coupled with removing lead from gasoline, can eliminate the respiratory route of exposure to lead and thereby radically decrease childhood lead exposure. Countries such as the United States have documented evidence of dramatic declines in child blood lead levels in correlation with the elimination of lead from gasoline. Setting and reducing targets (e.g., below 10 ug/dl) for child blood lead levels, as well as recording and tracking these levels provides an excellent means of assessing progress on reducing child lead exposure and helping countries to identify key sources of lead pollution.

At Home

- Identify possible in-home sources of lead, such as paint, water, food containers. Seek professional advice on actions to take regarding lead-based paint and its removal.
- Keep the house as clean and dust-free as possible.
- Wash hands frequently and let tap water run for 30 seconds before drinking water to reduce lead concentrations from water standing in pipes.
- Provide children with vitamin-rich nutrition to reduce absorption of lead.
- If indicated, request that a doctor or clinic conduct blood lead level tests for children, which is especially important in a child's first two years of life, for children whose household members have tested high for lead, for children who live in lead exposed areas and for children whose household members work in industries that use lead.

At School

- Schools should be located away from major roads and industrial sources of lead.
- Keep the school facilities clean and as dust-free as possible.
- Teachers and staff should employ good hygiene practices, such as frequent hand-washing, and instruct children to do the same.
- Schools should identify whether or not lead-based paint has been used in the facilities and, if so, be vigilant about flaking lead-based paint and seek professional assistance for action to remove sources of lead exposure.

In the community

- Disseminate information about childhood lead poisoning, with emphasis on the special vulnerabilities of children, sources of lead contamination, ways to eliminate lead sources.
- Test and report results on lead found in soil, air, water, foods, toys and other items that children use.
- Advocate for effective regulation and policy-setting to decrease lead exposure.
- Healthcare professionals should increase their knowledge about lead poisoning, screen children for lead exposure and report results of blood lead levels.

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