

UNDERSTANDING BIOAVAILABILITY of ARSENIC and LEAD in Soils at Superfund Sites



THE PROBLEM

Soil at a Superfund site is contaminated with arsenic and/or lead.

Arsenic and lead are elements naturally found in soil at levels that vary depending on the region. Natural processes such as weathering, or human processes such as mining, agriculture or manufacturing, may result in exposure to levels of arsenic or lead that are unsafe for human health.

Bioavailability refers to how much of a contaminant is absorbed into the body following contact (exposure) with contaminated soil. Ingestion (swallowing) of soil is the most common way a contaminant enters the body.

HOW CAN THIS AFFECT ME AND MY FAMILY?

Exposure to contaminated soil could cause health problems. Children may be more likely to develop health problems since they have smaller bodies than adults and are still growing, and engage in behaviors that may make them more susceptible to harm from contaminants.

Arsenic and lead present in soil must be bioavailable in order to pose a risk to your health.



PHOTO COURTESY OF CDC / CADE MARTIN

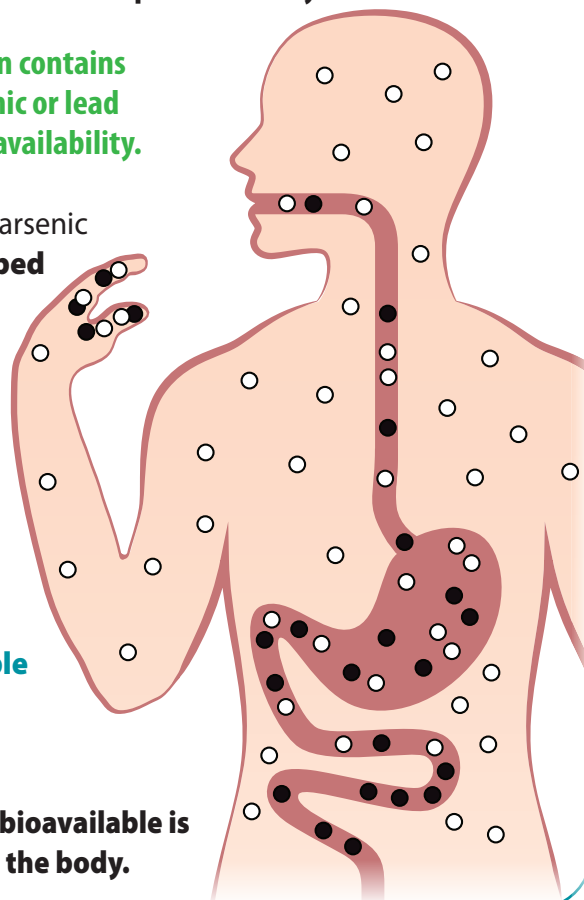
Contaminated soil often contains different forms of arsenic or lead that have different bioavailability.

Bioavailable forms of arsenic and lead will be **absorbed into the body and processed or stored** following ingestion of contaminated soil.

Bioavailable
arsenic or lead
(light circle ○)

Non-bioavailable
arsenic or lead
(dark circle ●)

A contaminant that is **not bioavailable** is **not absorbed, and leaves the body.**



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HOW CAN I BE EXPOSED?

Not all of the arsenic and/or lead present in the soil is in a form that can harm your health. A contaminant must be able to move into the body (exposure) and then be absorbed inside the body to have an effect on health.

Routes of exposure to arsenic or lead in soil include:

- Ingestion (swallowing) of contaminated soil and dust (especially for children, who put objects and hands in their mouths),
- Ingestion of unwashed foods grown in contaminated soil,
- Inhalation (breathing) of soil particles or dust, or
- Absorption of contaminants through the skin

HOW IS RISK ADDRESSED AT SITES?

A risk assessment is performed by the US Environmental Protection Agency (EPA) to estimate the risk to human health of exposure to a contaminant at a Superfund site.

EPA considers how much of a contaminant is bioavailable in the soil, and evaluates possible routes of exposure.

EPA incorporates oral bioavailability information to refine human health risk estimates to achieve cleanup goals at Superfund sites.

WHAT CAN I DO?

You can take simple steps to reduce your exposure to arsenic or lead in contaminated soils or dust.



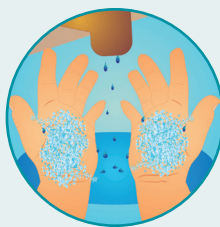
Practice safe gardening and wash foods grown in contaminated soil.



Take shoes off at the door



Clean pets' feet and fur at the door



Wash hands after handling soil



Use damp (not dry) mopping/dusting



Be aware of other sources of exposure (e.g. drinking water) and try to minimize your total exposure

WHERE CAN I GET MORE INFORMATION?

<http://www.epa.gov/superfund/soil-bioavailability-superfund-sites>