



## Cadmium

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen, chlorine, or sulfur. Most soil and rocks, including coal and mineral fertilizers, contain some cadmium. Cadmium is used in many products, including batteries, pigments, metal coatings, and plastics, and it is found in cigarette smoke. Cadmium enters the environment through mining operations and the action of wind and rain. Forest fires and volcanoes also release some cadmium to the air.

### How People Are Exposed to Cadmium

People are exposed to cadmium through their diet, since cadmium is absorbed into plant and animal foods that people eat. People are exposed to higher amounts of cadmium by breathing cigarette smoke. In the workplace, people are exposed where cadmium is used or generated, such as in battery manufacturing, metal soldering, or welding.

### How Cadmium Affects People's Health

When eaten, large amounts of cadmium can severely irritate the stomach and cause vomiting and diarrhea. Breathing high levels of cadmium damages people's lungs and can cause death. Exposure to low levels of cadmium in air, food, water, and particularly in tobacco smoke over time may build up cadmium in the kidneys and cause kidney disease and fragile bones. Cadmium is considered a cancer-causing agent.

### Levels of Cadmium in the U.S. Population

In the *Fourth National Report on Human Exposure to Environmental Chemicals (Fourth Report)*, CDC scientists measured cadmium in the blood of 8372 participants aged one year and older and in the urine of 2543 participants aged six years and older who took part in the National Health and Nutrition Examination Survey (NHANES) during 2003–2004. Prior survey periods of 1999–2000 and 2001–2002 are also included in the *Fourth Report*. By measuring cadmium in blood and urine, scientists can estimate the amounts of cadmium that have entered people's bodies.

- CDC researchers found cadmium in most participants. Blood and urinary cadmium levels are known to increase with age, as seen in the *Fourth Report*.
- The highest levels of urine cadmium in the U.S. population were only slightly lower than levels associated with indicators of changes in the kidney.

Finding a measurable amount of cadmium in blood or urine does not mean that the levels of cadmium cause an adverse health effect. Biomonitoring studies on levels of cadmium provide physicians and public

health officials with reference values so that they can determine whether people have been exposed to higher levels of cadmium than are found in the general population. Biomonitoring data can also help scientists plan and conduct research on exposure and health effects.

#### **For More Information**

- Agency for Toxic Substances and Disease Registry  
**Toxic Substances Portal for Cadmium**  
<http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=15>
- Environmental Protection Agency  
**Cadmium**  
<http://www.epa.gov/iris/subst/0141.htm>
- International Agency for Research on Cancer  
**Cadmium and Cadmium Compounds**  
<http://monographs.iarc.fr/ENG/Monographs/vol58/volume58.pdf>
- National Institute for Occupational Safety and Health  
**Safety and Health Topic: Cadmium**  
<http://www.cdc.gov/niosh/topics/Cadmium/>

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