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## *CDC's Third National Report on Human Exposure to Environmental Chemicals*

### **Spotlight on Cadmium**

Cadmium is a natural element in the Earth's crust. Cadmium is not usually present by itself in the environment but as a mineral combined with other elements. 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 is found in cigarette smoke. The weathering and mining of rocks and minerals that contain cadmium allow the element to get into the environment. Forest fires and volcanoes also release some cadmium to the air.

#### **How People Are Exposed to Cadmium**

People can be exposed to significant amounts of cadmium by

- Breathing cadmium in cigarette smoke.
- Breathing contaminated air in workplaces where cadmium is generated such as in battery manufacturing, metal soldering, or welding facilities.
- People can be exposed to levels of cadmium through their general diet.

#### **How Cadmium Affects People's Health**

- Eating food or drinking water with very high levels of cadmium severely irritates the stomach and may 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 may cause kidney disease.
- Long-term effects of cadmium exposure also include fragile bones.
- The International Agency for Research on Cancer has determined that cadmium may cause cancer in people. The U.S. Environmental Protection Agency has determined that inhaling cadmium probably causes cancer.

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

- For the *Third Report*, scientists tested levels of cadmium in blood samples from people 1 year and older and urine samples from people 6 years and older who took part in CDC's national study known as the National Health and Nutrition Examination Survey. Finding levels of cadmium in people's blood may mean that they were exposed to cadmium recently or that the exposure happened over time. However, cadmium in people's urine may mean their exposure occurred over time.
- Recent research studies have shown that urine cadmium levels as low as 1 microgram per gram of creatinine may be associated with subtle kidney injury (that is, injury that may not be readily apparent) and an increased risk for low bone mineral density. CDC is not establishing a new level of health concern in this *Report*, but is noting how population urine cadmium levels compare with results of recent research. The *Third Report* showed that about 5% of the people in the U.S. population aged 20 years and older had urinary cadmium levels at or near these levels. Cigarette smoking is the likely source for these higher cadmium levels. These cadmium findings should promote further research on public health consequences of cadmium in people.

## For More Information

- **Agency for Toxic Substances and Disease Registry**  
Public Health Statement for Cadmium:  
<http://www.atsdr.cdc.gov/toxprofiles/phs5.html>  
ToxFAQs for Cadmium:  
<http://www.atsdr.cdc.gov/tfacts5.html>
- **U.S. Environmental Protection Agency**  
Cadmium:  
<http://www.epa.gov/iris/subst/0141.htm>
- **International Agency for Research on Cancer**  
Cadmium and Cadmium Compounds:  
<http://www-cie.iarc.fr/htdocs/monographs/vol58/mono58-2.htm>

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