

Mercury in the Environment and Health Effects



UNDERSTAND WHERE MERCURY CAN BE FOUND AND HOW TO PROTECT YOURSELF

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Mercury in the environment and human exposure to mercury

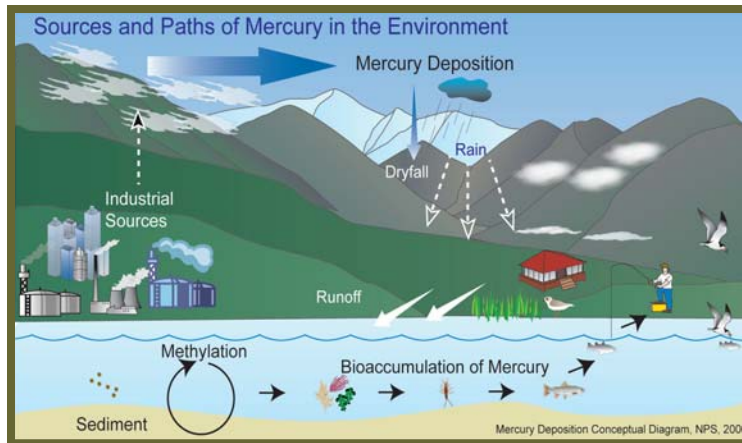
Three main chemical forms of mercury affect human health: Elemental, Inorganic and Organic.*

Elemental Mercury

Elemental mercury is a heavy, odorless, silver colored liquid at room temperature. Elemental mercury is also known as metallic mercury, liquid mercury, liquid silver and quicksilver.

About 95 percent of atmospheric mercury is elemental. Natural sources such as volcanoes, deep sea vents, and geysers release tons of mercury to the atmosphere and oceans. Natural forces move mercury through the environment, from air to soil to water. Mercury in the air falls to the earth with dust, rain, and snow. Once in the environment, mercury evaporates from the oceans, leaves of plants, and other surfaces and returns back into the air we breathe. Also, mercury can be driven into the air by forest fires.

In addition to mercury releases from nature, human activities have greatly increased the amount of mercury cycling in the atmosphere,



soils, lakes, and streams through processes such as burning coal for electricity, burning municipal and hazardous waste, cement manufacturing, pulp and paper milling, and some forms of mining.

Approximately two-thirds of atmospheric mercury originates from human activities. Human exposure to elemental mercury occurs most often from inhaling vapors from mercury-containing dental fillings (amalgams), as well as breathing air near broken compact fluorescent light bulbs (CFLs) and other damaged or broken mercury-containing products. Liquid metallic mercury is sometimes swallowed, which can occur when a mercury-containing thermometer

breaks in one's mouth. Fortunately, little of swallowed mercury is absorbed in the body. In a healthy person, swallowed elemental mercury passes through the intestines and is excreted relatively quickly. Mercury vapors from dental fillings, however, are continuously emitted, especially when one chews or passes hot liquid over the teeth.

Inorganic Mercury

Inorganic mercury compounds occur when mercury combines with elements such as chlorine, sulfur, or oxygen. Most of these mercury compounds – referred to as mercury salts – are white powders or crystals. Inorganic mercury may still be used in some antiseptic and skin-lightening creams.

Organic Mercury

When elemental mercury enters water bodies such as lakes and streams it is subsequently converted by bacteria into an organic compound, usually **methylmercury**. Methylmercury is able to enter the aquatic food chain where it accumulates in fish tissue. Since methylmercury is readily absorbed by the gut, wildlife (such as ducks and other waterfowl) that live in aquatic environments and eat fish may contain elevated levels of mercury. Many bodies of water in New Mexico have fish consumption advisories due to the elevated levels of mercury in fish living in these waters. Consumption of these fish or waterfowl by humans may result in adverse health impacts.

Ethylmercury is another form of organic mercury. This type of mercury is found in thimerosal, a preservative still used in some vaccines. Fortunately thimerosal is no longer present in childhood vaccines in New Mexico.

*Organic compounds consist of carbon combined with other substances. Organic compounds, such as methylmercury, are formed and readily absorbed by living things.

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Mercury primarily affects the human brain, nervous system, kidneys, liver and cardiovascular system.

Health effects of mercury exposure

Exposure to **elemental mercury** vapors produce neurological effects primarily; however, kidney problems may also develop. Because mercury impairs the development of the brain and nervous system, unborn and young children are particularly vulnerable to mercury toxicity. In adults, mercury can cause nervous system problems and have adverse effects on the cardiovascular system.

The kidney is the most sensitive organ when there is **inorganic mercury** exposure. Therefore, human exposure

to inorganic mercury salts may result in kidney damage.

The effects of exposure to **organic mercury** (e.g. methylmercury or ethylmercury) are primarily neurological. Other effects can include reduced reproductive success, impaired growth and development, behavioral abnormalities, hearing loss, reduced immune response and decreased survival.

Unborn and young children are the most susceptible to the toxic effects of organic mercury.

Know where mercury is in your environment

The following are foods and other products that are **known** to contain mercury.

- All fish and shellfish have some level of mercury in them. Some fish have more mercury than others. Check current advisories for fish caught in New Mexico to determine which fish (and how much) are safe to eat.
- Silver-colored dental fillings (amalgams) contain high levels of mercury. Ask your dentist about alternatives and follow all safety precautions if you work in a dental office setting.
- Mercury-containing thermometers, thermostats, barometers, electrical switches and relays. Opt for using digital thermometers in your home.
- Compact fluorescent lights (CFLs), tube fluorescents, high intensity mercury vapor, and high-pressure sodium and metal halide lights contain mercury. Learn how to dispose of used bulbs and how to clean up after broken bulbs.

- Vials containing liquid mercury that are sold as charms for necklaces or bracelets.

- Liquid mercury ("quicksilver") sold in botanicals for use in folk medicine or practices such as *Santeria* and *Espiritismo* sold under the name "azogue".

The following products **may** contain mercury:

- Some athletic shoes, toys and cards that light up or make noise.
- Some flu shots. You may ask for a thimerosal-free shot option. Fortunately thimerosal is no longer present in childhood vaccines in New Mexico.
- Some folk remedies and imported cosmetics, such as skin lightening creams.

Visit www.health.state.nm.us/eheb and www.doh.wa.gov/ehp/mercury/products.htm for a detailed list of products that contain mercury, and learn how to clean up after a mercury spill and how to avoid mercury during pregnancy.

Potential mercury sources:



Pay attention to postings at local lakes and streams to learn if it is safe to eat caught fish.