QUICK THOUGHTS ON MERCURY: A FACT SHEET

What is mercury?

Mercury, or in Tagalog "asoge", occurs naturally in the environment and exists in a large number of forms. Mercury is a constituent element of the earth, a heavy metal. In pure form it is known as "elemental" or "metallic". Mercury is rarely found in nature as the pure, liquid metal, but rather within compounds.

What are the forms of mercury?

a) Elemental mercury is a heavy, silvery-white metal that is liquid at usual temperatures and atmospheric pressures. Mercury vaporizes readily at usual room temperatures. Most of the mercury encountered in the earth's atmosphere is elemental mercury vapor.

b) Inorganic mercury compounds, e.g. mercuric sulfide (HgS). These compounds are called mercuric salts. Most inorganic mercury compounds are white powders or crystals, except for mercuric sulphide, which is read and turns black after exposure to light.

c) Organic mercury. When mercury combines with carbon, the compounds form what is called organic mercury. There is a potentially large number of organic mercury in the environment; the most common is methyl mercury.

Why is mercury a concern?

a) Mercury is a toxin and is harmful to humans and wildlife. Significant adverse impacts on human health and the environment have been documented around the world. Some populations are especially susceptible to mercury exposure, most notably the fetus, the newborn and young children because of their developing nervous systems.

b) Mercury is present throughout the environment. As an element mercury can not be destroyed. Mercury levels in the environment have increased considerably since the on-set of the industrial age. Mercury is now present in various environmental media and food.

c) Mercury is persistent and cycles globally. Once mercury is released into the environment it persists and cycles through various media, e.g. air, water, etc. Mercury that is deposited can change form into methyl mercury (through microbial action). Methyl mercury has the capacity to collect in organisms (bioaccumulate) and concentrate up food chains (biomagnify), especially in the aquatic food chain.

How toxic is mercury to humans?

Mercury and its compound are highly toxic, especially to the developing nervous system. The degree of toxicity to humans and wildlife depends on the chemical form of mercury, the amount, the exposure pathway, and the vulnerability of the person exposed.

The primary form of mercury that is of concern is methyl mercury. This compound readily passes the placental barrier and blood brain barrier, and is a potent neurotoxicant, which can cause adverse effects on the developing brain. Studies have shown that methyl mercury in pregnant women's diets can have subtle, persistent adverse effects on children's development. Moreover, some studies suggest that small increases in methyl mercury exposure may cause adverse effect on the cardiovascular system. It is believed that many people and wildlife are presently exposed at levels that pose risks of these, and possibly other effects.

Where does mercury come from?

Mercury is released by natural sources like volcanoes, by evaporation from soil and water surfaces, as well as through the degradation of minerals and forest fires. Mercury is also contained as a trace element in coal. The large use of coal-fired power plants in generating electricity, make mercury emissions to the air from this source among the world's largest.

Furthermore, mercury is available on the world market from several sources, e.g. mines as a by-product of mining or refining of other metals (such as zinc, gold, silver) or minerals, as well as refining of natural gas, recycled mercury recovered from spent products and waste from industrial processes

Mercury is also found in many products, e.g. fluorescent lamps, thermometers, dental amalgam fillings, batteries, vaccines (as preservative in form of ethyl mercury in thimerosal), soaps and creams (as a bactericide and/or whitening agent)

How might I be exposed to mercury?

Primary exposure of mercury to humans is through diet. However, people can also be exposed to mercury by breathing in air or drinking water contaminated with mercury compounds.

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In the Philippines, the main source of mercury pollution is from small-scale gold mining (SSM). There are about 100,000 people in Luzon and Mindanao engaged in SSM. It is conservatively estimated that for every gram of gold retrieved, two to five grams of mercury are released into the environment which threatens to pollute rivers and agricultural areas[1].

What impacts might mercury have on the environment?

Mercury and its compounds are toxic to aquatic life even at low concentrations. The amount of mercury in one thermometer, when diffused in an aquatic environment, can contaminate a 20-acre lake.

What is the current government policy on mercury?

The Department of Environment and Natural Resources (DENR) requires that importers, distributors, manufacturers, transporters of products with mercury obtain an importation clearance, and register with a license to use and purchase from the DENR - Environmental Management Bureau. They are also required submit quarterly reports to the DENR-Environmental Management Bureau, as well as retain records of their activities and transactions. The government creates limits for the use of mercury-containing products.

Containers or vessels containing mercury must be properly labeled and should be stored in secure places, with provisions for appropriate emergency responses in case of accidents. Any violators of the requirements specified will be subjected to administrative and criminal penalties and liabilities[2].

In Aug. 11, 2008, the Department of Health issued Administrative Order 21 mandating the gradual phase-out of all mercury containing devices in all hospitals and health care facilities by 2010.

In a press release dated Jan. 11, 2008, Senator Eduardo Angara filed a bill in the Senate which seeks to 1) control the sale of elemental mercury, 2) impose proper labeling of products containing mercury, 3) phase out products with mercury content, 4) ban mercury-containing toys, games, cosmetics and apparel, 5) ban the sale and distribution of Hg thermometers, 6) ban mercury in school laboratories, and 7) promote public education and information on the hazards posed by mercury[3].

What are some simple steps to take to prevent or reduce mercury exposure?

For consumers, the easiest way is to avoid mercury containing products and use mercury-free alternatives. Eat large fish species that may be contaminated with mercury in moderation, e.g. swordfish, mackerel, blue marlin, etc. If pregnant it is best to avoid these types of fishes.

For manufacturers or distributors, they properly label their products if it contains mercury, and more importantly they should phase-out mercury or import mercury-free products.

For the government, strict controls are needed starting with mandatory labeling of products, phase-out of mercury in commerce, and producer responsibility should be mandated as well.

For all three actors there should be proper mercury waste management. Products like empty batteries, broken thermometers and broken lamps should be properly disposed of.

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[1] http://www.senate.gov.ph/press_release/2008/0111_angara2.asp. Note that some studies peg the amount of mercury release from small-scale gold mining up to 30 grams emitted per 1 gram of gold retrieved.

[2] http://www.emb.gov.ph/chemicals/DAO%2097-38.pdf

[3] http://www.senate.gov.ph/press_release/2008/0111_angara2.asp