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Health Effects of Polychlorinated Biphenyls (PCBs)

WHAT ARE PCBS?

Polychlorinated biphenyls (also known as PCBs) are a family of man-made chemicals that were used in many commercial and electrical products until their manufacture was banned in the mid-1970s. Some electrical equipment still in use contains PCBs. Most PCBs used in the United States were mixtures of PCBs sold under the trade name Aroclor.

WHAT ARE THE HEALTH EFFECTS OF EXPOSURE TO PCBS?

Human Data

Industrial workers who were exposed to large amounts of PCBs in air and perhaps through their skin experienced skin, eye and respiratory tract irritation and mild changes in the functioning of their livers. Less frequently, workers exposed to high levels reported headache, digestive disturbances, and showed liver problems. These workers were also exposed to other, more toxic chemicals that may have caused the effects.

Some studies of pregnant women suggest a link between a mother's increased exposure to PCBs from eating contaminated fish or from other environmental sources and slight effects on her child's birth weight, short-term memory, and learning. A recent study suggested that women who eat contaminated fish have slightly shorter menstrual cycles. However, the women in all the studies were also exposed to other chemicals and the effects of these chemicals on them and their children are not understood.

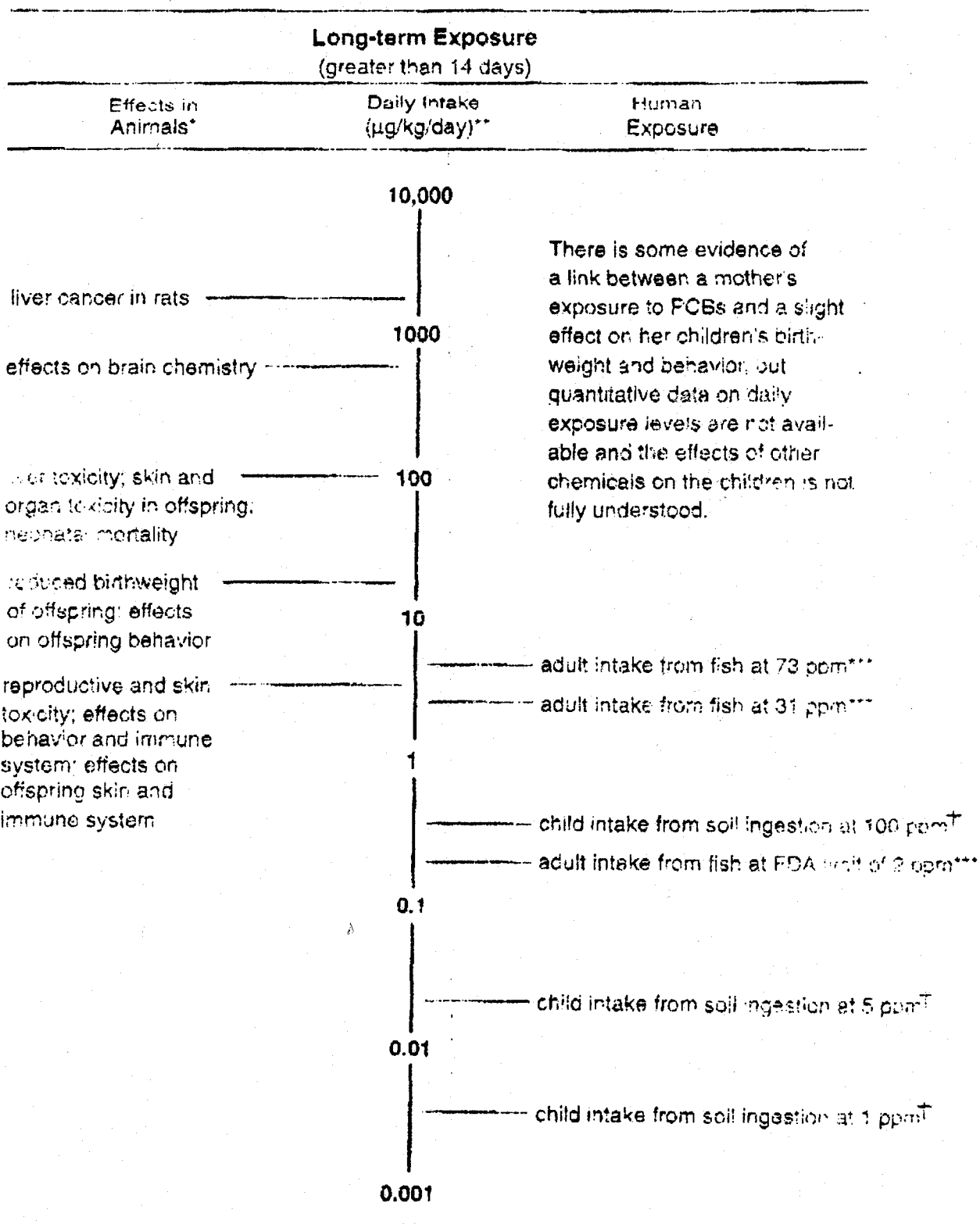
Animal Studies

PCBs affects the skin, liver and the nervous, immune and reproductive systems of animals exposed to high doses. It also reduces the birth weight and changes the behavior of offspring born to animals exposed before, during and after pregnancy. A few individual PCBs cause birth defects in offspring born to animals exposed to high levels during pregnancy. Some types of PCBs cause cancer in laboratory animals exposed to high levels over their lifetime. Whether or not PCBs cause cancer in humans is unknown.

As with any chemical exposure, the health effects of PCBs depend on the level and length of exposure. Figure 1 compares the health effects in laboratory animals (on the left side of the figure) to estimated exposures for a child playing in the soil or an adult eating fish (on the right side of the figure). We were forced to use animal data in the example because good data on the daily PCB exposures that are associated with health effects in humans are not available. We included children in the example because they may be more sensitive to PCBs and are more likely than adults to incidently ingest PCB-contaminated soil (for example, they are more likely than adults to put dirty fingers in their mouths). The daily intakes listed on Figure 1 are estimates of PCBs taken into the body and depend on, but are not the same number as, the PCB concentrations in the soil or fish.

Bureau of Toxic Substance Assessment
Prepared for NYS DEC Investigation of Hudson River Dredge Material (January, 1998)

Figure 1. Health Effects from Exposure to PCBs



*These effects are listed at the lowest level at which they were first observed. They may also be seen at higher levels.

**Micrograms of PCBs per kilogram body weight per day.

***Ppm is parts per million. Intake based on consumption of 1/2 pound of fish per month. The US Food and Drug Administration (FDA) tolerance level for PCBs in fish is 2 ppm. Largemouth bass at Griffin Island averaged 31 ppm in 1996 and 73 ppm in 1977.

†Assumes a 13.2 kilogram child (2-3 years old) ingests an average of 68 milligrams soil per day.