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Fact Sheet

Mercury Update: Impact on Fish Advisories

Mercury is distributed throughout the environment from both natural sources and human activities. Methylmercury is the main form of organic mercury found in the environment and is the form that accumulates in both fish and human tissues. Several instances of methylmercury poisoning through consumption of contaminated food have occurred; these resulted in central nervous system effects such as impairment of vision, motor in-coordination, loss of feeling, and, at high doses, seizures, very severe neurological impairment, and death. Methylmercury has also been shown to be a developmental toxicant, causing subtle to severe neurological effects. EPA considers there is sufficient evidence for methylmercury to be considered a developmental toxicant, and to be of concern for potential human germ cell mutagenicity. As of December 2000, 41 states have issued 2,242 fish advisories for mercury. These advisories inform the public that concentrations of mercury have been found in local fish at levels of public health concern. State advisories recommend either limiting or avoiding consumption of certain fish from specific waterbodies or, in some cases, from specific waterbody types (e.g., all freshwater lakes or rivers).

The purpose of this fact sheet is to summarize current information on sources, fate and transport, occurrence in human tissues, range of concentrations in fish tissue, fish advisories, fish consumption limits, toxicity, and regulations for mercury. The fact sheets also illustrate how this information may be used for developing fish consumption advisories. An electronic version of this fact sheet and fact sheets for dioxins/furans, PCBs, and toxaphene are available at **http://www.epa.gov/OST/fish**. Future revisions will be posted on the web as they become available.

Sources of Mercury in the Environment

Mercury is found in the environment in the metallic form and in different inorganic and organic forms. Most of the mercury in the atmosphere is elemental mercury vapor and inorganic mercury; most of the mercury in water, soil, plants, and animals is inorganic and organic mercury (primarily methyl-mercury).

Mercury occurs naturally and is distributed throughout the environment by both natural processes and human activities. Solid waste incineration and fossil fuel combustion facilities contribute approximately 87% of the emissions of mercury in the United States. Other sources of mercury releases to the air include mining and smelting, industrial processes involving the use of mercury such as chlor-alkali production facilities and production of cement.

Mercury is released to surface waters from naturally occurring mercury in rocks and soils and from industrial activities, including pulp and paper mills, leather tanning, electroplating, and chemical manufacturing. Wastewater treatment facilities may also release mercury to water. An indirect source of mercury to surface waters is mercury in the air; it is deposited from rain and other processes directly to water surfaces and to soils. Mercury also may be mobilized from sediments if disturbed (e.g., flooding, dredging).

Sources of mercury in soil include direct application of fertilizers and fungicides and disposal of solid waste, including batteries and thermometers, to landfills. The disposal of municipal incinerator ash in landfills and the application of sewage sludge to crop land result in increased levels of mercury in soil. Mercury in air may also be deposited in soil and sediments.

Fate and Transport of Mercury

The global cycling of mercury is a complex process. Mercury evaporates from soils and surface waters to the atmosphere, is redeposited on land and surface water, and then is absorbed by soil or sediments. After redeposition on land and water, mercury is commonly volatilized back to the atmosphere as a gas or as adherents to particulates.

Mercury exists in a number of inorganic and organic forms in water. Methylmercury, the most common organic form of mercury, quickly enters the aquatic food chain. In most adult fish, 90% to 100% of the mercury is methylmercury. Methylmercury is found primarily in the fish muscle (fillets) bound to proteins. Skinning and trimming the fish does not significantly reduce the mercury concentration in the fillet, nor is it removed by cooking processes. Because moisture is lost during cooking, the concentration of mercury after cooking is actually higher than it is in the fresh uncooked fish.

Once released into the environment, inorganic mercury is converted to organic mercury (methylmercury) which is the primary form that accumulates in fish and shellfish. Methylmercury biomagnifies up the food chain as it is passed from a lower food chain level to a subsequently higher food chain level through consumption of prey organisms or predators. Fish at the top of the aquatic food chain, such as pike, bass, shark and swordfish, bioaccumulate methylmercury approximately 1 to 10 million times greater than dissolved methylmercury concentrations found in surrounding waters.

In 1984 and 1985, the U.S. Fish and Wildlife Service collected 315 composite samples of whole fish from 109 stations nationwide as part of the National Contaminant Biomonitoring Program (NCBP). The maximum, geometric mean, and 85th percentile concentrations for mercury were 0.37, 0.10, and 0.17 ppm (wet weight), respectively. An analysis of mercury levels in tissues of bottom-feeding and predatory fish using the data from the NCBP study showed that the mean mercury tissue concentration of 0.12 ± 0.08 ppm in predatory fish species (e.g., trout, walleye, largemouth bass) was significantly higher than the mean tissue concentration of 0.08 ± 0.06 ppm in bottom feeders (e.g., carp, white sucker, and channel catfish).

Mercury, the only metal analyzed as part of EPA's 1987 National Study of Chemical Residues in Fish (NSCRF), was detected at 92% of 374 sites surveyed. Maximum, arithmetic mean, and median concentrations in fish tissue were 1.77, 0.26, and 0.17 ppm (wet weight), respectively. Mean mercury concentrations in bottom feeders (whole body samples) were generally lower than concentrations for predator fish (fillet samples) (see Table 1). Most of the higher tissue concentrations of mercury were detected in freshwater fish samples collected in the Northeast.

In 1998, the northeast states and eastern Canadian provinces issued their own mercury study, including a comprehensive analysis of mercury concentrations in a variety of freshwater sportfish collected from the late 1980s to 1996. Top level predatory fish such as walleye, chain pickerel, and large and smallmouth bass were typically found to exhibit the highest concentrations, with mean tissue residues greater than 0.5 ppm and maximum residues exceeding 2 ppm. One largemouth bass sample was found to contain 8.94 ppm of mercury, while a smallmouth bass sampled contained 5 ppm. Table 2 summarizes the range and the mean concentrations found in eight species of sportfish sampled.

Table 3 provides national ranges and mean concentrations for several species of freshwater fish collected by states from the late 1980s to early 2001. 43 states have provided EPA with 90,000 records of chemical contaminant fish tissue data. These data are available in the online *National Listing of Fish and Wildlife Advisories* (U.S. EPA 2001b) at www.epa.gov/ost/fish.

Table 1. Mean Mercury Concentrations in Freshwater Fish[a]

Species	Mean concentration (ppm)[b]
Bottom Feeders	
Carp	0.11
White sucker	0.11
Channel catfish	0.09
Predator Fish	
Largemouth bass	0.46
Smallmouth bass	0.34
Walleye	0.52
Brown trout	0.14

[a] EPA National Study of Chemical Residues in Fish 1987;
[b] Concentrations are reported on wet weight basis
Source: Bahnick et al., 1994.

Table 2. Mercury Concentrations for Selected Fish Species in the Northeast

Species	Mean concentration[a] (ppm)	Minimum-maximum range[a] (ppm)

Largemouth bass	0.51	0-8.94
Smallmouth bass	0.53	0.08-5.0
Yellow perch	0.40	0-3.15
Eastern chain pickerel	0.63	0-2.81
Lake trout	0.32	0-2.70
Walleye	0.77	0.10-2.04
Brown bullhead	0.20	0-1.10
Brook trout	0.26	0-0.98

[a] Concentrations are reported on a wet weight basis.
Source: NESCAUM, 1998.

Table 3. Mercury Concentrations for Selected Fish Species in the U.S.

Species	Mean concentration[a] (ppm)	Range
Largemouth bass	0.52	0.0005 - 8.94
Smallmouth bass	0.32	0.005 - 3.34
Yellow perch	0.25	0.005 - 2.14
Eastern chain pickerel	0.61	0.014 - 2.81
Lake trout	0.27	0.005 - 2
Walleye	0.43	0.005 - 16
Northern Pike	0.36	0.005 - 4.4

[a] Concentrations are reported on a wet weight basis.
Source: NLFWA, 2000.

Because of the higher cost of methylmercury analysis, EPA recommends that total mercury rather than methylmercury concentrations be determined in state fish contaminant monitoring programs. EPA also recommends that the assumption be made that all mercury is present as methylmercury in order to be most protective of human health.

Potential Sources of Exposure and Occurrence in Human Tissues

Potential sources of human exposure to mercury include food contaminated with mercury, inhalation of mercury vapors in ambient air, and exposure to mercury through dental and medical treatments. Dietary intake is by far the dominant source of exposure to mercury for the general population. Fish and other seafood products are the main source of methylmercury in the diet; studies have shown that methylmercury concentrations in fish and shellfish are approximately 1,000 to 10,000 times greater than in other foods, including cereals, potatoes, vegetables, fruits, meats, poultry, eggs, and milk.

Individuals who may be exposed to higher than average levels of methylmercury include recreational and subsistence fishers who routinely consume large amounts of locally caught fish and subsistence hunters who routinely consume the meat and organ tissues of marine mammals.

Analytical methods are available to measure mercury in blood, urine, tissue, hair, and breast milk.

Fish Advisories

The states have primary responsibility for protecting their residents from the health risks of consuming contaminated noncommercially caught fish. They do this by issuing consumption advisories for the general population, including recreational and subsistence fishers, as well as for sensitive subpopulations (such as pregnant women/fetus, nursing mothers and their infants, and children). These advisories inform the public that high concentrations of chemical contaminants, such as mercury, have been found in local fish. The advisories recommend either limiting or avoiding consumption of certain fish from specific waterbodies or, in some cases, from specific waterbody types (such as lakes or rivers).

As of December 2000, mercury was the chemical contaminant responsible, at least in part, for the issuance of 2,242 fish consumption advisories by 41 states. Almost 79% of all advisories issued in the United States are at least partly due to mercury contamination in fish and shellfish. Advisories for mercury have increased steadily, by 149% from 899 advisories in 1993 to 2,242 advisories in 2000. The number of states that have issued mercury advisories also has risen steadily from 27 states in 1993 to 41 states in 2000. Advisories for mercury increased nearly 8% from 1999 (2,073 advisories) to 2000 (2,242 advisories).

Thirteen states have issued statewide advisories for mercury in their freshwater lakes and/or rivers: Connecticut, Kentucky, Indiana, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, North Carolina, Ohio, Vermont and Wisconsin. Another nine states (Alabama, Florida, Georgia, Louisiana, Maine, Mississippi, North Carolina, and Texas) have statewide mercury advisories in effect for their coastal marine waters. Figure 1 shows the total number of fish advisories for mercury in each state in 2000 (U.S. EPA, 2001a).

Fish Consumption Limits—EPA indicated in the *Mercury Study Report to Congress* (U.S. EPA, 1997) that the typical U.S. consumer was not in danger of consuming harmful levels of methylmercury from fish and was not advised to limit fish consumption on the basis of mercury content. This advice is appropriate for typical consumers who eat less than 10 grams of fish and shellfish per day with mercury concentrations averaging between 0.1 and 0.15 ppm. At these rates of fish intake, methylmercury exposures are considerably less than the reference dose (RfD) of 1×10^{-4} mg/kg-d. However, eating more fish than is typical or eating fish that are more contaminated, can increase the risk to a developing fetus.

Two groups of women of childbearing age are of concern: (1) those who eat more than 10 grams of fish a day and (2) those who eat fish with higher methylmercury levels. Ten grams of fish is a little over one-quarter cup of tuna per week or about one fish sandwich per week. Based on diet surveys, 10% of women of childbearing age eat five times or more fish than does the average consumer. If the fish have average mercury concentrations of 0.1 to 0.15 ppm, the women's mercury exposures range from near or slightly over the RfD to about twice the RfD.

The second group of women of concern are those who eat fish with higher mercury concentrations (e.g., 0.5 ppm and higher). Examples of fish with above average mercury levels are king mackerel, various bass species, pike, swordfish, and shark. Even women eating average amounts of fish (i.e., <10 g/d) have mercury exposures near the RfD, if the mercury concentration is 0.5 ppm. If women eat these fish species and their average fish intake is between 40 and 70 grams/day (or about a quarter cup per day), their mercury exposures would range from three to six times the RfD. Consumers who eat fish with 1 ppm mercury (e.g., swordfish and shark) at the level of 40 to 70 g/d have intakes that range from 6 to nearly 12 times the RfD.

Some women of childbearing age in certain ethnic groups (Asians, Pacific Islanders, and Native Americans) eat much more fish than the general population. Because of the higher amounts of fish in their diets, women in these ethnic groups need to be aware of the level of mercury in the fish they eat.

The RfD is not a "bright line" between safety and toxicity; however, there is progressively greater concern about the likelihood of adverse effects above this level. Consequently, people are advised to consume fish in moderate amounts and be aware of the amount of mercury in the fish they eat.

For some populations, such as pregnant women, nursing mothers, and young children, some states have issued either "no consumption" advisories or "restricted consumption" advisories for methylmercury. Additional information on calculating specific limits for these sensitive populations is available in EPA's Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 2, Section 3 (U.S. EPA 2000).

Table 4 shows the recommended monthly fish consumption limits for methylmercury in fish for fish consumers based on EPA's default values for risk assessment parameters. States may select other scientifically defensible values for developing fish advisories. Consumption limits have been calculated as the number of allowable fish meals per month based on the ranges of methylmercury in the consumed fish tissue. The following assumptions were used to calculate the consumption limits:

- Consumer adult body weight of 70 kg
- Average fish meal size of 8 oz (0.227 kg)
- Time-averaging period of 1 mo (30.44 d)
- EPA's reference dose for methylmercury (1×10^{-4} mg/kg-d) from EPA's Water Quality Criterion for the Protection of Human Health : Methylmercury (U.S. EPA, 2001c).

For example, when methylmercury levels in fish tissue are 0.4 ppm, then two 8-oz. (uncooked weight) meals per month can safely be consumed.

Table 4. Monthly Fish Consumption Limits for Methylmercury

Risk-based consumption limit	Noncancer health endpoints
Fish meals/month	**Fish tissue concentrations (ppm, wet weight)**
16	> 0.03–0.06
12	> 0.06–0.08
8	> 0.08–0.12
4	> 0.12–0.24
3	> 0.24–0.32
2	> 0.32–0.48
1	> 0.48–0.97
0.5	> 0.97–1.9
None (<0.5)[a]	> 1.9

[a] None = No consumption recommended.
NOTE: In cases where >16 meals per month are consumed, refer to EPA's *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories,* Volume 2, Section 3 for methods to determine safe consumption limits.

Toxicity of Mercury

***Pharmacokinetics*—**Methylmercury is rapidly and nearly completely absorbed from the gastrointestinal tract; 90% to 100% absorption is estimated. Methylmercury is somewhat lipophilic, allowing it to pass through lipid membranes of cells and facilitating its distribution to all tissues, and it binds readily to proteins. Methylmercury binds to amino acids in fish muscle tissue.

The highest methylmercury levels in humans are generally found in the kidneys. Methylmercury in the body is considered to be relatively stable and is only slowly transformed to form other forms of mercury. Methylmercury readily crosses the placental and blood/brain barriers. Estimates for its half-life in the human body range from 44 to more than 80 days.

Excretion of methylmercury is via the feces, urine, and breast milk. Methylmercury is also distributed to human hair and to the fur and feathers of wildlife; measurement of mercury in hair and these other tissues has served as a useful biomonitor of contamination levels.

***Acute Toxicity*—**Acute high-level exposures to methylmercury may result in impaired central nervous system function, kidney damage and failure, gastro- intestinal damage, cardiovascular collapse, shock, and death. The estimated lethal dose is 10 to 60 mg/kg.

Chronic Toxicity—Both elemental mercury and methylmercury produce a variety of health effects at relatively high exposures. While recent studies indicate that lower dose exposure can have effects on the cardiovascular and immune systems, neurotoxicity is the effect of greatest concern. This is true whether exposure occurs to the developing embryo or fetus during pregnancy or to adults and children. Human exposure to methylmercury has generally been through consumption of contaminated food. Two major episodes of methylmercury poisoning through fish consumption have occurred. The first occurred in the early 1950s among people, fish consuming domestic animals such as cats, and wildlife living near Minamata City on the shores of Minamata Bay, Kyushu, Japan. The source of the methylmercury contamination was effluent from a chemical factory that used mercury as a catalyst and discharged wastes into the bay where it accumulated in fish and shellfish that were a dietary staple of this population. Average fish consumption was reported to be in excess of 300 g/d, 20 times greater than is typical for recreational fishers in the United States. By comparison, about 3% to 5% of U.S. consumers routinely eat 100 grams of fish per day. Among women of childbearing age, 3% routinely eat 100 grams of fish per day.

In 1965, another methylmercury poisoning incident occurred in the area of Niigata, Japan. The signs and symptoms of the disease in Niigata were similar to those of methylmercury poisoning in Minamata.

Methylmercury poisoning also occurred in Iraq following consumption of seed grain that had been treated with a fungicide containing methylmercury. The first outbreak occurred prior to 1960; the second occurred in the early 1970s. In this case, imported mercury-treated seed grains that arrived after the planting season were ground into flour and baked into bread. Unlike the long-term exposures in Japan, the epidemic of methylmercury poisoning in Iraq was short in duration lasting approximately 6 months. The signs and symptoms of disease in Iraq were predominantly in the nervous system: difficulty with peripheral vision or blindness, sensory disturbances, incoordination, impairment of walking, and slurred speech. Both children and adults were affected. Some infants born to mothers who had consumed methylmercury contaminated grain (particularly during the second trimester of pregnancy) showed nervous system damage even though the mother was only slightly affected or asymptomatic.

Three recent epidemiology studies in the Seychelles Islands, New Zealand, and the Faroe Islands were designed to evaluate childhood development and neurotoxicity in relation to fetal exposures to methylmercury in fish-consuming populations. Prenatal methylmercury exposures in these three populations were within the range of some U.S. population exposures. No adverse effects were reported from the Seychelles Islands study, but children in the Faroe Islands exhibited subtle dose-related deficits at 7 years of age. These effects include abnormalities in memory, attention, and language. In the New Zealand prospective study, children at 4 and 6 years of age exhibited deficiencies in a number of neuropsychological tests.

In addition to the three large epidemiological studies, studies on both adults and children were conducted in the Amazon; Ecuador; French Guiana; Madeira; Mancora, Peru; northern Quebec; and Germany. Effects of methylmercury on the nervous system were reported in all but the Peruvian population.

There has been considerable discussion within the scientific community regarding the level of exposure to methylmercury that is likely to be without an appreciable risk of deleterious health effects during a lifetime. In 1999, the Congress directed EPA to contract with the National Research Council (NRC) of the National Academy of Sciences to evaluate the body of data on the health effects of methylmercury. NRC published their report, *Toxicological Effects of Methylmercury*, in 2000. EPA generally concurred with the NRC findings and recommendations and used them in determining the EPA RfD for methylmercury. EPA chose to base the RfD on data from the Faroes study. The Seychelles study has no findings of effects associated with methylmercury exposure, and thus is not the best choice for a public health protective risk estimate. While the New Zealand study does show mercury-related effects it relatively small by comparison to the other two.

Benchmark dose analysis was chosen as the most appropriate method of quantifying the dose-effect relationship. This lower 95% limit (BMDL) on a 5% effect level obtained by applying a K power model (K $ 1) to Faroese dose-response data based on mercury in cord blood. It was found that several endpoints are sensitive measures of methylmercury effects in the Faroese children. The BMDLs and corresponding estimates of ingested methylmercury are within a very small range and cluster around a level of 1 : g/kg bw/day. Rather than choosing a single measure for the RfD critical endpoint, EPA considers that this RfD is based on several scores which are indications of neuropsychological processes related to the ability of a child to learn and process information. An uncertainty factor of 10 was applied. This included a factor of 3 for pharmacokinetic variability and uncertainty; one area of pharmacokinetic uncertainty was introduced with the assumption of equivalent cord blood and maternal blood mercury levels. An additional factor of 3 addressed pharmacokinetic variability and uncertainty. Other areas of concern include inability to quantify possible long-term sequelae for neurotoxic effects, questions as to the possibility of observing adverse impacts (such as cardiovascular effects) below the BMDL, and lack of a two-generation reproductive effects assay.

Developmental Toxicity—Data are available on developmental effects in rats, mice, guinea pigs, hamsters, and monkeys. Also, convincing data from a number of human studies (i.e., Minamata, Iraq, New Zealand, and the Faroe Islands) indicate that methylmercury causes subtle to severe neurologic effects depending on dose and individual susceptibility. EPA considers methylmercury to have sufficient human and animal data to be classified as a developmental toxicant.

Methylmercury accumulates in body tissue; consequently, maternal exposure occurring prior to pregnancy can contribute to the overall maternal body burden and result in exposure to the developing fetus. In addition, infants may be exposed to methyl-mercury through breast milk. Therefore, it is advisable to reduce methylmercury exposure to women with childbearing potential to reduce overall body burden.

Mutagenicity and Reproductive Effects - Methyl-mercury appears to be clastogenic but not to be a point mutagen; that is, mercury causes chromosome damage but not small heritable changes in DNA.
EPA has classified methylmercury as being of high concern for potential human germ cell mutagenicity. The absence of positive results in a heritable mutagenicity assay keeps methylmercury from

being included under the highest level of concern. The data on mutagenicity are not sufficient, however, to permit estimation of the amount of methylmercury that would cause a measurable mutagenic effect in the human population. There is no two-generation study of reproductive effects, but shorter term studies in rodents, guinea pigs and monkeys have reported observations consistent with reproductive deficits.

Carcinogenicity - Three human studies have been identified that examined the relationship between methylmercury exposure and cancer. There was no persuasive evidence of increased carcinogenicity attributable to methylmercury exposure in any of these studies. Interpretation of these studies was limited by poor study design and incomplete descriptions of methodology and/or results. Experimental animal data suggest that methylmercury may be tumorigenic in animals. Chronic dietary exposures of mice to methylmercury resulted in significant increases in the incidences of kidney tumors in males but not in females. The tumors were seen only at toxic doses of methylmercury. EPA has found methylmercury to have inadequate data in humans and limited evidence in animals.

All of the carcinogenic effects in animals were observed in the presence of profound damage to the kidneys. Tumors may be formed as a consequence of repair in the damaged organs. Evidence points to a mode of action for methylmercury carcinogenicity that operates at high doses certain to produce other types of toxicity in humans. Given the levels of exposure most likely to occur in the U.S. population, even among consumers of large amounts of fish, methylmercury is not likely to present a carcinogenic risk. EPA has not calculated quantitative carcinogenic risk values for methylmercury.

Summary of EPA Health Benchmarks

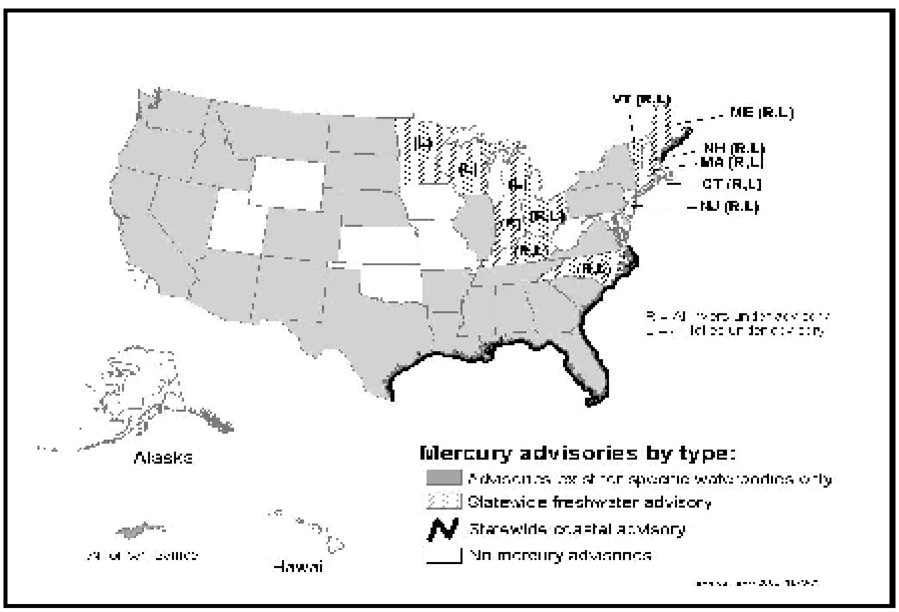
- Chronic Toxicity–Reference Dose: 1×10^{-4} mg/kg-d (U.S. EPA, 2001)
- Carcinogenicity:Not likely to be human carcinogen under conditions of exposure

Special Susceptibilities—The developing fetus is thought to be at particular risk of neurotoxic effects from methylmercury exposure. Data on children exposed only after birth are insufficient to determine if this group has increased susceptibility to the adverse central nervous system effects of methylmercury. Children are considered to be at increased risk of methylmercury exposure by virtue of their greater food consumption as a percentage of body weight (mg food/kg body weight) compared to adult exposures. Additional studies indicate that aging populations may be particularly susceptible to effects of mercury exposure.

Interactive Effects—Potassium dichromate and atrazine may increase the toxicity of mercury, although these effects have been noted only with metallic and inorganic mercury. Ethanol increases the toxicity of methylmercury in experimental animals. Vitamins D and E, thiol compounds, selenium, copper, and possibly zinc are antagonistic to the toxic effects of mercury.

Critical Data Gaps—Additional data are needed on the exposure levels at which humans experience subtle, but persistent, adverse neurological effects. Data on immunologic effects and cardiovascular effects are not sufficient for evaluation of low-dose methylmercury toxicity.

Figure 1: Mercury Advisories for 2000


VT (R,L)
ME (R,L)
NH (R,L)
MA (R,L)
CT (R,L)
NJ (R,L)
(R,L)
(R,L)
(R,L)
Alaska
Hawaii
Mercury advisories by type:
Statewide freshwater advisory

EPA Regulations and Advisories

- # Maximum Contaminant Level inorganic mercury in drinking water = 0.002 mg/L

- # Toxic Criteria for those States Not Complying with CWA Section 303(c)(2)(B) - criterion concentration for priority toxic pollutants:
  - – Freshwater: maximum = 1.4 : g/L, continuous = 0.77 : g/L
  - S Saltwater: maximum = 1.80 : g/L, continuous = 0.94 : g/L
  - – Human health consumption of organisms = 0.3 mg/kg methylmercury fish tissue (wet weight).

- # Water Quality Guidance for the Great Lakes System—protection of aquatic life in ambient water:
  - – acute water quality criteria for mercury total recoverable: maximum = 1.694 : g/L
  - – chronic water quality criteria for mercury total recoverable: continuous = 0.908 : g/L
  - – water quality criteria for protection of human health, drinking water and nondrinking water: maximum = 1.8×10^{-3} : g/L
  - – water quality criteria for protection of human health (mercury including methylmercury) = 1.3×10^{-3} : g/L.

- # Listed as a hazardous air pollutant under Section 112 of the Clean Air Act

- # Emissions from mercury ore processing facilities and mercury chlor-alkali plants = 2,300 g maximum/24 h

- # Emissions from sludge incineration plants, sludge drying plants, or a combination of these that process wastewater treatment plant sludge = 3,200 g maximum/24 h

- # Ban of phenylmercuric acetate as a fungicide in interior and exterior latex paints

- # Reportable quantities: Mercury, mercuric cyanide = 1 lb; mercuric nitrate, mercuric sulfate, mercuric thiocyanate, mercurous nitrate, mercury fulminate = 10 lb; phenylmercury acetate = 100 lb.

- # Listed as a hazardous substance: Mercuric cyanide, mercuric nitrate, mercuric sulfate, mercuric thiocyanate, mercurous nitrate

- # Reporting threshold for Toxic Release Inventory (proposed) = 10 lb

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Additional information regarding contaminants in fish and health risks is available from the following Internet site: http://www.epa.gov/ost/fish