

QS AND AS FOR RELEASE OF ATSDR'S TOXICOLOGICAL PROFILE ON MERCURY TO SUPPLEMENT INFORMATION IN THE KEY COMMUNICATIONS POINTS 4/19/99

ATSDR TOXICOLOGICAL PROFILE

Q: What is the effect of this new ATSDR toxicological profile? What does it mean to me, the consumer?

A: The profile reflects the current knowledge about all forms of mercury (elemental/metallic, inorganic, and organic). It contains expanded information concerning the broad spectrum of uses of elemental mercury, including folk medicinal and ethnic religious uses, which can result in significant exposure and lead to a variety of adverse health effects. The profile also contains important information on how to clean up elemental mercury spills, such as when an oral thermometer or barometer is broken. It provides information about chelation therapy, a medical process used to reduce the levels of mercury in the body, and cautions against inappropriate use of this therapy.

In addition, the profile contains a discussion of the more recent information on dental amalgam fillings, including a recent review of the literature by the U.S. Department of Health and Human Services (DHHS) Working Group on Dental Amalgam, which supported the standing DHHS policy concerning the safety of dental amalgam.

The Toxicological Profile for Mercury provides a detailed discussion of human populations exposed to methylmercury through seafood consumption for generations in the Seychelles and Faroe Islands, as well as other key human studies of exposed populations in New Zealand, Brazil, and elsewhere. The profile also contains a presentation of key issues discussed at the expert panel review of mercury coordinated by ATSDR in July 1998 and the Federal government sponsored scientific workshop held in November 1998.

Q: Why did the MRL change from the proposed level of 0.5 in the October 1997 Public Comment Draft of the profile to 0.3 in the present version?

A: The MRL was revised after ATSDR reviewed data which have become available since publication of the public comment version of the profile. The value of 0.5 $\mu\text{g}/\text{kg}/\text{day}$ that appeared in the 1997 public comment draft of the mercury profile was based upon the 29-month Seychelles data, which reported a median maternal hair mercury level of 5.9 ppm as a NOAEL. The 66-month Seychelles data and the Faroe Island were not yet published at the time the public comment draft was released. The 0.5 $\mu\text{g}/\text{kg}/\text{day}$ MRL was endorsed at the 20-21 July Expert Panel Review of the first post-public comment draft of the Toxicological Profile for Mercury.

Following the publication of those studies, this new data was carefully considered in the revision of the chronic oral MRL for methylmercury. The current MRL of 0.3 $\mu\text{g}/\text{kg}/\text{day}$ was

based upon the NOAEL of 15.3 ppm for the highest exposure group (quantile) in the 66-month Seychelles study in accordance with ATSDR's peer-reviewed, published methodology for deriving MRLs. The new MRL takes into consideration the results of the Seychelles and Faroes, studies, factoring both into the calculation of the MRL.

FEDERAL ACTIONS TO PROTECT THE PUBLIC FROM MERCURY EXPOSURE

Q: What steps are being taken to reduce emissions of mercury?

A: A number of actions by EPA will help to reduce mercury pollution, including issuing regulations for industries that significantly contribute to mercury pollution. These actions, once fully implemented will reduce mercury emissions caused by human activities by over 50 percent from 1990 levels.

◆ Actions to reduce mercury releases:

- EPA has issued technology based control standards for mercury emissions from municipal waste combustors, and medical waste incinerators. EPA will soon promulgate standards for hazardous waste combustors including incinerators, cement kilns, and light weight aggregate kilns that burn hazardous waste. Also under development by EPA are emissions standards to lower mercury emissions from chlor-alkali plants and mercury and other hazardous air pollutants from industrial, commercial, and institutional boilers; process heaters; industrial, commercial, and other non-hazardous solid waste combustors (excluding municipal waste combustors and medical waste incinerators); gas turbines; and stationary internal combustion engines. In addition EPA is reviewing and considering alternatives to the current treatment standard for wastes containing high levels of mercury.
- Data from the Mercury Study indicate that industrial manufacturers are shifting away from mercury use. As a result, domestic demand for mercury decreased more than 75 percent between 1988 and 1996. EPA believes this shift is largely a result of Federal bans on mercury additives in paint and pesticides; industry efforts to reduce mercury in batteries and other products; increasing state regulation of mercury emissions and mercury in products; and state-mandated recycling programs.
- EPA supports the efforts of state and local governments to achieve mercury discharge reductions through outreach and technical assistance for mercury pretreatment programs at sewage treatment plants. EPA also assists States and Tribes in developing innovative regulatory approaches, such as a market-based emissions reduction program for the State of Minnesota. EPA is developing a new water quality criterion for mercury based on current toxicity assessments, more appropriate estimates of fish consumption, and more accurate estimates of bioaccumulation, and will soon publish a new more accurate and more sensitive

analytical method for testing mercury in water.

- In cooperation with States, EPA has initiated two pilot efforts to develop Total Maximum Daily Loads for mercury which will relate water quality impairments to local and regional air point sources.
- EPA has undertaken a number of voluntary efforts to encourage reduced use of mercury by industries such as hospitals.

◆ Actions to provide information to the public:

- Until we can eliminate the need for fish consumption advisories, Federal, State and Tribal governments will continue to assure the public's right to know about whether and which fish are safe and in what amounts. The States and Tribes are usually in the best position to give advice about whether fish from local waters are safe to eat. EPA works with States and Tribes in all aspects of developing advisories to assure that scientifically sound methods are used in developing, issuing and communicating consumption advisories. This includes giving scientific and technical advice and providing grants for monitoring efforts and chemical analysis. An important result of this effort has been that the majority of States now use a commonly accepted scientific method for setting these advisories. EPA also is working with States and Tribes to assure that the nation's rivers and lakes are accurately assessed to determine if they contain fish that should not be consumed or only consumed in limited quantities.
- Mercury compounds are currently listed on the Toxics Release Inventory (TRI) and reports are received from facilities that release mercury into the environment. However, to date few facilities have reported mercury releases because the reporting threshold is too high to capture releases from many covered facilities. In order to ensure that reporting on mercury to TRI will be fully effective, especially taking into account releases from industrial facilities newly subject to TRI, EPA has proposed a rule to reduce the reporting threshold for mercury and other substances.
- This year, EPA is gathering emissions data about coal-fired electric generating plants, the largest source of anthropogenic mercury emissions accounting for one-third of all U.S. emissions. All coal-fired power plants above 25 MW must provide the results of analysis to determine the mercury content of the coal they are burning. In addition, a sample of plants are required to perform stack testing for quantity and species of mercury emissions. The information obtained from this effort will allow EPA to calculate the amount and species of mercury emitted by each coal-fired plant above 25 MW. This information will be available to the public. This information will support a regulatory determination and potential future regulatory decisions. It also will provide information to the public about mercury emissions.
- Actions to control air emissions of other pollutants will also reduce mercury

emissions. With implementation of the new National Ambient Air Quality Standards for fine particulate matter and ozone, and the second phase of the acid rain program, EPA expects to see a reduction of mercury emissions from utility boilers. Actions to reduce emissions of the greenhouse gases that are responsible for climate change could also reduce mercury emissions from utilities and other industrial boilers.

- On April 7, 1997, the United States and Canada signed the Great Lakes Binational Toxics Strategy. Although both the United States and Canada have domestic strategies to reduce mercury pollution, a coordinated strategy is necessary for the greatest reduction in toxic substances throughout the Great Lakes Basin. The goal of the strategy is to seek, by 2006, a 50 percent reduction in the deliberate use of mercury and a 50 percent reduction in the release of mercury caused by human activity. The goal for releases applies to all sources of mercury emissions to the air nationwide as well as to all sources that directly discharge mercury to the water within the Great Lakes Basin. USEPA and Environment Canada are working with all industrial sectors that release mercury, States, Tribes, environmental groups and the public, to help identify and undertake specific mercury reduction activities.

Q: What is FDA doing to protect consumers from exposure to unsafe levels of mercury in commercial seafood?

A: FDA's program for methylmercury is generally the same as other dietary chemical contaminants. In summary, FDA tracks the data available from worldwide sources, including its own monitoring, on amounts of methylmercury in commercial species. FDA also monitors, and occasionally supports, key epidemiological studies that have been conducted and are ongoing that bear on the effects of methylmercury in humans. Traditionally, FDA has used all these data, as well as data on consumption levels of commercial seafood in the U.S., to establish a guidance level of 1 ppm for the amount of methylmercury in seafood. FDA considers regulatory action on seafood that contains higher levels.

FDA is currently in the process of evaluating all the data from new studies on the effects of methylmercury. FDA expects that the wealth of new data on this subject will enable it to conduct a comprehensive reassessment of its regulatory stance on methylmercury in commercial seafood.

FDA did issue an advisory for pregnant women and women of childbearing age who may become pregnant to limit their consumption of shark and swordfish to no more than once a month because these species have higher levels of methylmercury than other commercial fish. The FDA also states that nursing women who follow this advice will not expose their infants to increased health risks from methylmercury. For the general population (other than pregnant women and women who may become pregnant), the FDA advises limiting the regular consumption of shark and swordfish to about 7 ounces per week (about one serving).

Q: FDA's action level is based on a health guidance value that is higher than ATSDR's MRL.

Will FDA do anything different in its inspection of fish or its actions on mercury in fish as a result of ATSDR changing its MRL?

A: FDA will take ATSDR's toxicological profile into account as part of its own reassessment of its regulatory stance on methylmercury in commercial seafood. Until its own reassessment is complete, the agency does not contemplate any changes. The ATSDR report does not identify the consumption of commercial seafood by U.S. consumers as a concern, nor is the ATSDR MRL significantly different from FDA's ADI.

Q: What is the status of FDA's Action Level review and what process will FDA follow before a new Action Level is adopted?

A: FDA has a longstanding commitment to review its action level of 1 ppm in light of the new scientific data that have become, and continue to become, available on methylmercury. The agency is conducting a scientific reassessment based on all data available from all sources, including the upcoming review of mercury health research by the National Academy of Sciences. At a minimum, FDA will consult with its Food Advisory Committee before making any final decisions and will engage in a public notice and comment process.

GUIDANCE VALUES USED BY DIFFERENT AGENCIES

Q: How else are MRLs used--beyond their intended purpose for use by public health officials as screening tools when determining whether further evaluation of potential human exposure at hazardous waste sites is warranted?

A: MRLs also serve a number of other public health uses, including:

- use as trigger values to alert primary care physicians to look for symptoms of exposure (particularly in the case of children or adults exposed to elemental mercury vapor);
- use in making recommendations on emergency removals at newly discovered hazardous waste or former industrial sites;
- in emergency response incidents, such as a chemical warehouse fire or train derailment, they serve as input for determinations of a variety of on-scene decisions, such as the level of protection needed for on-site workers and whether evacuation of adjacent populations is necessary;
- to identify populations at potential risk, such as at accident chemical spill sites;
- as a basis for calculating other health guidance values, such as ATSDR's soil ingestion screening levels.

Q: Do the MRLs in the new Toxicological Profile for Mercury have an impact on clean up decisions at Superfund sites?

A: The change in ATSDR's MRL will not have an impact on cleanup decisions at Superfund sites. EPA's *Interim Agency Guidance on the Use of the Methylmercury Reference Dose in Making Risk Management Decisions* reiterates that EPA's Programs and Regions will continue to use 0.1 $\mu\text{g}/\text{kgbw}/\text{day}$ as the RfD for methylmercury for health risk assessments until the Agency has had an opportunity to review the work of the NAS. EPA makes cleanup decisions at Superfund sites based in part on overall protection of human health and the environment, as determined through a baseline human health and ecological risk assessment utilizing the Agency's consensus toxicity information.

ATSDR does provide input on various decisions at Superfund sites. The change in the chronic oral MRL for methylmercury may impact future public health assessments for Superfund sites, although that cannot be determined before each site is evaluated. The acute and intermediate duration MRLs for inorganic forms of mercury did not change from the previous version of the Profile. The new MRL for chronic inhalation exposure to elemental mercury vapor is only slightly lower (more protective) than EPA's RfC for that substance.

Q: Why do so many different agencies have different names for their health guidance values if they're all conceptually the same?

A: While the health guidance values (HGVs) for various federal agencies are based upon similar derivation methodologies, similar acknowledged areas of uncertainty, and quite often identical scientific data bases, the legislative mandates that drive the development of those HGVs are different. Historically, FDA was the first agency to employ this concept using the term acceptable daily intake (ADI) for determining acceptable levels if ingested in a daily diet. EPA adopted the term reference dose (or RfD) in place of ADI in the mid 1980's. EPA felt the term "acceptable" implied a risk management judgment, which is not considered to be the role of the risk assessment. The term "reference dose" was considered more neutral and does not imply that the dose is or is not acceptable or that higher doses are not acceptable. ATSDR's MRLs, which are not intended for use in setting either regulatory standards or site-specific clean-up levels, are so-named because of the specific charge given to that agency by Congress (e.g., to establish substance-specific levels which pose minimal risk to public health).

Q: What is WHO's health guidance value?

A: WHO's evaluation of human health risks for adults concluded that a daily methylmercury consumption of $.48 \mu\text{g}/\text{kg}$ body weight will not result in detectable adverse effects on the adult's nervous system. The WHO evaluation also recognized that the fetus has different sensitivity to methylmercury than does the adult. WHO concluded that in populations consuming large amounts of fish (e.g., 100 grams/day), the hair levels of methylmercury in women of child-bearing age should be monitored. If the results of these monitoring activities indicate excessive exposure to methylmercury, appropriate and practical measures, such as dietary recommendations, should be taken to reduce the possibility of long-term exposure during pregnancy and to keep it below internationally recommended allowable intakes.

WHO also concluded that measures to reduce methylmercury exposure via the consumption of fish will need to consider the impact of these measures on the overall dietary requirements of

these individuals.

MERCURY WORKSHOP IN NORTH CAROLINA

Q: Who organized the workshop on methylmercury held in North Carolina last November and what was its purpose?

A: The workshop was organized by an interagency committee at the request of the Office of Science and Technology Policy (OSTP). The organizing committee was chaired by the National Institute of Environmental Health Sciences (NIEHS), and it included representatives from:

Department of Health and Human Services (DHHS)

- Office of the Assistant Secretary for Planning and Evaluation
- Centers for Disease Control and Prevention (CDC)
- Agency for Toxic Substances and Disease Registry (ATSDR)
- Food and Drug Administration (FDA)

Environmental Protection Agency (EPA)

National Oceanic and Atmospheric Administration (NOAA)

Office of Science and Technology Policy (OSTP)

Office of Management and Budget (OMB)

The purpose of the workshop was to discuss and evaluate the major epidemiologic studies associating methylmercury exposure with an array of developmental measures in children.

Although the workshop did not attempt to derive a risk assessment, the product of the workshop should facilitate agreement on risk assessment issues. The major studies considered were those which have examined exposed persons in Iraq, the Seychelles, the Faroe lands and the Amazon along with the most relevant animal studies for estimating human risks. The workshop was the result of discussions of an interagency workgroup considering approaches for utilizing the emerging data from the Faroe Islands study and the Seychelles cohort. The purpose of the workshop was to review the Seychelles and Faroe data beyond that of a journal peer review because of the data will be used for policy setting.

Q: How was the workshop structured and who participated?

The workshop was structured around the deliberations of five panels:

- Exposure Panel
- Neurobehavioral Endpoints Panel
- Confounders and Variables Panel
- Design and Statistics Panel
- Experimental Panel

Detailed presentations were made by each study team (Seychelles, Faroes and Amazon), which focused on their responses detailed questions posed by the organizers. Each panel addressed

their issues in plenary sessions as well as in separate breakout groups in which invited observers and other observers were allowed to participate. The observers included broad representation from State and Federal agencies, industry and public interest groups. In addition, there were 11 public comments to the panels on the second day.

On the final day of the workshop each panel presented summaries of their discussions and recommendations in plenary session.

Q: What were the key findings and recommendations from the workshop?

A: There were five:

1. Methylmercury is a developmental neurotoxin although effects at low doses encountered by eating fish are difficult to evaluate.
2. All the studies reviewed were considered of high scientific quality and the panel recognized that each of the investigations had overcome significant obstacles to produce important scientific information. The panel also stated that continued funding of the studies in the Seychelles, Faroes and Amazon is necessary for the full potential of those studies to be realized. This is particularly the case for the Faroes and Seychelles studies which are currently assessing the potential developmental neurotoxic effects of methylmercury in fish eating populations. The developmental studies would benefit by evaluation of common endpoints using similar analytical methods. It is important to note that the Amazon study did not assess developmental endpoints but assessed effects in adults.
3. Results from the Faroes and Seychelles studies are credible and provide valuable insights into the potential health effects of methylmercury.
4. Some differences are clearly present in results from the Faroes, Seychelles, and Amazon, but the panels were not able to identify clearly the sources of these differences. Among possible sources are the different effects of episodic versus continuous exposure, ethnic differences in methylmercury responses, lack of common endpoints in the Faroes and Seychelles studies, several other confounders or modifying factors such as those found in diet and lifestyle, and in chemicals present in seafood which is the source of methylmercury to these populations. The other chemical constituents of seafood that may be explanatory include those that may be beneficial to fetal neurodevelopment (i.e. omega 3 fatty acids) and those that may be harmful to fetal neurodevelopment (e.g. PCBs).
5. These studies have provided valuable new information on the potential health effects of methylmercury but significant uncertainties remain. Uncertainty remains because of issues related to exposure, neurobehavioral endpoints, confounders and statistics and design.

Q: Are the results of the workshop considered by EPA in their interim guidance and by ATSDR in their toxicological profile on methylmercury?

A: Yes, deliberations of the panels and the workshop report are a key factor in both the ATSDR toxicity profile for mercury and the EPA interim guidance on mercury.

Q: How was the workshop report prepared? Is it available to the public?

The report was prepared by the National Institute of Environmental Health Sciences, drawing on summaries from the five panels, reviews by the interagency organizing committee, publications from the key epidemiological studies, and detailed responses by the study teams. It is available by contacting: britton@niehs.nih.gov or Fax: (919) 541-0295.

NATIONAL ACADEMY OF SCIENCES STUDY ON MERCURY

Q: What is the NAS study? Why is it being undertaken? What is its time frame?

A: In the conference report accompanying the FY1999 EPA appropriation, the Congress directed EPA to fund the National Academy of Sciences to perform a comprehensive review of mercury health research and to make recommendations to EPA on a mercury exposure reference dose. In requesting this study the Congress wanted the NAS to shed light on unresolved issues related to the interpretation of health effects data on methyl mercury. The NAS has formed a Committee of recognized experts to undertake this review. The NAS Committee is expected to meet for the first time in May 1999 and is requested by the Congress to deliver its final report no later than May 2000.

All of the Federal health agencies are committed to considering the report when it becomes available.

BASIC INFORMATION ABOUT MERCURY

Q: What is mercury?

A: Mercury is a chemical element. As such it is neither created nor destroyed -- the same amount of mercury has existed since the earth was formed. However, human activity greatly influences how much mercury is biologically available. Mercury is toxic to humans and wildlife. Ingestion of elevated concentrations can cause neurotoxic effects such as impairment of movement, speech, walking and hearing; impairment of peripheral visions, and other neurological effects.

Q: The terminology seems to flip back and forth between mercury and methylmercury--are these the same? There are three kinds of mercury discussed in the Profile -- organic (e.g., methyl), elemental, and inorganic. What are the difference in terms of chemistry, health effects, and anything else that might be important to the public?

A: Mercury is released to the air from a number of natural and industrial sources and then deposited on land and bodies of water. There are three kinds of mercury discussed in the report -- methyl, elemental, and inorganic.

Organic forms of mercury, such as methylmercury is the form of mercury to which humans and wildlife are generally exposed, usually from eating fish which have accumulated mercury in their muscle tissue. Methylmercury bioaccumulates through the food chain and once in the body can cross the placenta and the blood-brain barrier.

Elemental and inorganic forms of mercury. Releases of mercury to the environment are usually in these forms, but transport and chemical reactions in the environment can change these forms of mercury to methylmercury which accumulates in fish.

Generally, when humans are exposed to sufficiently high doses of elemental and methylmercury they can experience effects on the nervous system. The range of effects can vary from subtle losses in motor skills and sensory ability to tremors, inability to walk, convulsions, and death.

Exposure to high levels of mercury has been associated with serious developmental effects in humans as well as damage to the nervous system. These effects have been corroborated by numerous scientific studies. Harmful effects in wildlife have also been reported; these include nervous system damage and behavioral and reproductive deficits. Human and wildlife exposure to mercury occur mainly through the ingestion of fish.

Q: Are there natural sources of mercury?

A: Mercury is a constituent of the environment and has always been present on the planet. As a naturally occurring element, mercury is present throughout the environment in both environmental media (water, air, soil) and biota (plants and animals). However, releases of mercury as a result of human activity are adding substantially to the mercury which is available to accumulate in humans and other animals.

Q: Is mercury in air safe to breathe?

A: Mercury concentrations in air can be hazardous to persons who work around mercury vapor or where there have been spills of liquid mercury. Occupational health and safety standards exist to protect such workers. In general, most commercial mercury emissions into the ambient air do not pose a concern until the mercury settles into waterways where it may contaminate fish that may ultimately be eaten by people.

Q: How does mercury get into the environment?

A: Mercury is released to the air primarily by burning fuel or waste which contains mercury. The highest emitters include municipal and medical waste incinerators, coal-fired electric utilities, chlor-alkali plants, primary lead smelters, cement manufacturers, and secondary mercury production. Each of these sources can release small amounts of mercury into the air. Abandoned gold and mercury mines and industrial plants that used mercury can be significant sources of releases to water.

Q: How does mercury move through the environment?

A: In the atmosphere, mercury is transported by wind either as a vapor or as particles. Mercury reaches water bodies either through direct deposition or as run-off from soil following rain events. In water bodies, mercury can be methylated and accumulate in fish.

Q: How long does mercury persist in the environment? Are mercury levels in the environment increasing or decreasing?

A: Mercury is neither created nor destroyed -- the same amount of mercury has existed since the earth was formed. Human activities have increased the amount of mercury which is currently cycling in the atmosphere, in soils, and in lakes, streams, and the oceans. Mercury in these locations increases risks to human and wildlife. Uses and releases of mercury have been reduced very substantially in recent decades in the U.S. and most other industrialized countries. However, due to the long-term cycling of huge amounts of previously released mercury in the environment, these reductions are not yet reflected in clear reductions of levels in fish or other environmental media.

Q: What are the major sources of mercury emissions?

A: EPA's 1997, Mercury Study Report to Congress identified the largest source of mercury emissions accounting for one-third of all anthropogenic (caused by human activity) emissions to the air as coal fired electric utilities. In order of prominence, utilities are followed by municipal waste combustors, accounting for approximately 19 percent of all anthropogenic emissions, commercial industrial boilers at 18 percent, medical waste incinerators at ten percent, and chlor-alkali plants and hazardous waste combustors accounting for over four percent each. Other important sources include portland cement plants, residential boilers, pulp and paper manufacturing.

Q: How are people exposed to mercury?

A: Mercury accumulates in the tissues of fish and animals. People are generally exposed to mercury primarily by eating fish, rather than through breathing mercury or absorbing it through their skin, unless they are exposed to mercury in an occupational setting or due to accidental spills or ritual uses of mercury.

Although small quantities of mercury are in the air and people are exposed to mercury through breathing, the resulting exposure is extremely small compared to exposure from fish consumption. Also, the chemical form of mercury in the air is different and less toxic than the form of mercury found in fish.

The level of mercury in drinking water is usually very low because mercury does not dissolve well in water. In addition, the mercury in drinking water is in a less toxic inorganic form. Thus, exposure to mercury through fish consumption is a much greater concern.

Q: Who is most vulnerable to mercury?

A: Two groups are most vulnerable to methylmercury: the fetus and children ages 14 and younger. Since exposure of the fetus is through the mother's fish consumption, concern for fetal

exposure focuses on pregnant women and those who may become pregnant. Women who may become pregnant are of concern for two reasons: (1) methylmercury persists in tissues so dietary intake prior to pregnancy is of concern, and (2) women usually do not know they are pregnant until the pregnancy is past many of the critical stages of fetal development. Children may be at higher risk of methylmercury exposure than are adults because they eat more per pound of body weight and because they may be inherently more sensitive than adults since their nervous systems are still developing.

Q: Which population groups have the highest levels of mercury?

A: The typical U.S. consumer eating fish from restaurants and grocery stores are not in danger of consuming harmful levels of mercury from fish and are not advised to limit fish consumption. However, people who eat large amounts of fish or fish with particularly high levels of methylmercury are at increased risk. Fish with particularly high levels of methylmercury include freshwater fish from contaminated waters, especially self-caught fish, and certain species of commercial marine fish, such as swordfish, and shark. The amount of mercury they are exposed to depends on the species of fish consumed, the concentration of methylmercury in the fish, and how much and how often they eat fish. Groups that tend to have higher exposure include subsistence and frequent recreational fishers, people of Asian origin, and some Native American groups.

SAFETY OF SEAFOOD

Q: Is it safe for me to eat fish?

A: Seafood is an important part of a healthy, balanced diet for everyone. Except for FDA's advice that pregnant women and women of childbearing age should limit consumption of shark and swordfish to once a month, and that the general population should limit their consumption of these species to once per week, the federal government's advice is that consumption of commercial seafood is safe.

FDA states that it is highly unlikely that a consumer could eat enough commercial seafood to experience a health effect from mercury. Specifically, FDA has advised consumers to limit their consumption of fish with levels averaging 0.5 ppm to two servings per week. The most frequently consumed commercial species of fish contain levels of mercury that average less than 0.5 ppm. With the exception of shark and swordfish, even commercial species that are eaten infrequently--e.g., king mackerel and tile fish--only rarely exceed 0.5 ppm. A consumer would have to eat two portions per week of such fish for an extended period of time before there might be any cause for concern. Anyone who feels that they might be in this category may contact the FDA Hotline (1-800-FDA-4010) to obtain further information. Since shark and swordfish may contain methylmercury levels around 1 ppm, consumers should limit their consumption of these species to about 7 ounces per week (about one serving).

Q: What about pregnant women, and children?

A: Because methylmercury is toxic to the human nervous system, and because the nervous system of the developing fetus is very sensitive to methylmercury, pregnant women should avoid high exposures to mercury. Certain large predatory fish, such as shark and swordfish, may contain more methylmercury than other marine fish, so pregnant women and women of childbearing age who may become pregnant should limit their consumption of these species to once a month, according to FDA. FDA does not believe it is necessary to expand its consumption advice to species other than shark or swordfish. Detailed dietary advice for these women is available from FDA.

At this time, we do not know whether children have the same sensitivity to mercury as adults or if their sensitivity is greater due to the fact that some nervous system development continues in young children. FDA's dietary advice suggests that children benefit from eating a variety of fish, as do adults. Levels of methylmercury in commercially purchased fish and shellfish are generally low, and do not represent a significant source of exposure to harmful levels of mercury for children. Consult FDA for more detailed advice on such concerns.

Q: What is the risk from eating canned tuna? Should consumers limit their consumption?

A: Canned tuna tend to be smaller species of tuna with relatively low average levels of methylmercury. FDA sampling over the years indicates that canned tuna tend to contain levels of methylmercury 2.5 to 10 times lower than the FDA action level of 1 ppm. Consequently, the agency has concluded that no consumer advisories are necessary for canned tuna, even though these products tend to be frequently consumed.

Q: If canned tuna is safe, why have seven states issued advisories to limit consumption of canned tuna?

A: FDA disagrees with these states' advice (see above).

Q: How much methylmercury is in fresh, not canned tuna?

A: Methylmercury levels in fresh tuna average about one third of the FDA action level, with the highest levels infrequently exceeding 0.5 ppm.

Q: What are the methylmercury levels in non-commercial species, such as those caught by subsistence or recreational fishers?

Some species of non-commercial fish in some locations contain levels of methylmercury that warrant limits on consumption. People catching non-commercial species should look to see if warning signs are posted along the water's edge. If there are signs, the advice printed on them should be followed.

Second, even if there are no warning signs, people should call their local or state health or environmental protection department and ask for their advice. (They are listed in the blue pages of the local telephone directory.) Ask them if there are any advisories on the kinds or sizes of fish that

may be eaten from the water bodies. People can also ask about fishing advisories at local sporting goods or bait shops where fishing licenses are sold.

A brochure entitled "Should I Eat the Fish I Catch?" is available in English, Spanish, or Hmong by calling 513-489-8190.

Q: What about when I travel to other countries--are there certain parts of the world with higher mercury levels? Should I not eat the fish there?

A: Since levels of mercury do vary geographically, a prudent traveler may want to be cautious when consuming fish from areas with known environmental pollution.

Q: Will ATSDR's finding have an impact on the seafood industry? Or other industries?

A: No. FDA has not revised its action level for methylmercury at this time and therefore the ATSDR finding will not have an impact on the seafood industry. In addition, the ATSDR MRL is not used for regulatory decisions and therefore should not have an impact on other industries.

NHANES

Q: What will the NHANES IV study tell us about methylmercury exposure?

A: NHANES IV is the Center for Disease Control and Prevention's fourth National Health and Nutrition Examination Survey. The primary purpose of this six year project is to produce information on the health and nutritional status of the U.S. population. A mercury exposure study, co-sponsored by a number of federal agencies/departments, will be conducted during the first three years of NHANES IV. Dietary survey information will also be collected. The purpose of the mercury study is to describe methylmercury exposure in the U.S. population. It will also include studies of specific portions of the population who are considered to be the most sensitive, i.e., women of child-bearing age and young children. The results of these studies will be available in about three years. These levels will help refine our understanding of the extent to which the U.S. population is or is not at risk.