



# THE CITY OF NEW YORK

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

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[nyc.gov/health](http://nyc.gov/health)

## 2007 New York City Department of Health and Mental Hygiene (DOHMH) Health Advisory # 11: Blood Mercury Levels in NYC Adult Women are Higher than Women Nationally; Providers Should Encourage Healthy Fish Consumption

A recent survey by DOHMH found that:

- 1 Average blood mercury levels in NYC adult women are three times higher than women nationally.
- 2 We estimate that one quarter of New York City residents and nearly half of Asian New Yorkers have blood mercury levels at or above the New York State reportable level of 5 µg/L. Though not associated with health risks to adults, levels higher than 5 µg/L during pregnancy may increase the risk of cognitive deficits in children.
- 3 Fish consumption is the most significant source of exposure to mercury.
- 4 Fish is a healthy food choice, but women who are pregnant, who may become pregnant, who are breastfeeding, and young children should choose fish that are lower in mercury.

Methyl mercury bio-accumulates in fish, with predatory, older and larger fish tending to have high levels. Exposure to methyl mercury can be detrimental to the developing brain, a concern for women who are pregnant or breastfeeding and parents feeding young children. However, fish are also rich in nutrients, high in protein, low in saturated fat, and many are significant sources of omega-3 fatty acids. A new brochure produced by DOHMH, "*Eat Fish, Choose Wisely*," provides guidance and is available at [nyc.gov/health](http://nyc.gov/health), and is attached to this advisory. Health care providers may order copies by calling 3-1-1.

**Please Distribute to All Clinical Staff in Obstetrics/Gynecology, Family Practice, Internal Medicine, Pediatrics, and Primary Care**

July 23, 2007

Dear Colleagues,

Blood mercury concentrations were measured in New York City residents aged 20 and over as part of a population-based survey conducted in 2004 (NYC HANES). Average blood mercury levels (geometric means) were more than three times higher than the national levels. Recent fish consumption was the strongest predictor of higher blood mercury levels.

Asian New Yorkers had the highest blood mercury concentrations, with foreign-born Chinese having particularly high levels. Higher income was also associated with higher mercury levels. Higher levels of mercury were associated with the frequency, portion size and species of fish consumed.

**Methyl Mercury Information:** Methyl mercury (MeHg) is an organic form of mercury that is a contaminant in many types of fish. Bacteria in bodies of water convert inorganic mercury, mostly generated from coal combustion, into organic mercury, where it travels up the food chain and accumulates in fish. Once consumed by people, MeHg is absorbed into the blood and distributed throughout the body, including the brain. During pregnancy, maternal MeHg crosses the placenta, concentrates in cord blood and enters the fetal brain. MeHg also passes into breast milk at lower concentrations. The half-life of MeHg in the blood is approximately 50 days, although this varies from person to person. The half-life of mercury in the brain appears to be much longer. MeHg exposure is best measured in whole blood as total blood mercury.

**Health Concerns:** Most people exposed to MeHg are asymptomatic, and acute symptoms from poisoning are rare in the United States. However, exposure may increase risk for subtle chronic adverse health outcomes, with neurodevelopmental effects from prenatal exposure being of primary concern.

Very high levels of prenatal exposure, as seen in the 1950s and 1960s in Minamata, Japan, may result in developmental deficits that include mental retardation, cerebellar ataxia, limb deformities, altered physical growth, sensory impairments and cerebral palsy. Children prenatally exposed to MeHg are at increased risks of subtle neurodevelopment deficits. A threshold for these risks has not been identified.

Using data from these risk assessments, the US Environmental Protection Agency (EPA) chose a reference dose that correlates with a blood mercury level of 5.8 µg/L. This concentration is one tenth the dose associated with an observed effect (58 µg/L), to take into account uncertainties in the data and biological variability in dose estimation, thus providing an additional measure of safety. MeHg in cord blood is estimated to be about 1.7 times the concentration of the mother's blood. Because cord blood mercury levels are higher than those of maternal blood, a woman's blood level would have to be lower than 3.4µg/L during pregnancy to not exceed the EPA reference dose in the developing fetus.

**NYC Study Findings:** None of the women in our survey had a blood mercury level greater than 58µg/L, though 18.9% of women aged 20-49 had levels ≥5.8 µg/L (EPA's reference dose) and 37.4% of women aged 20-49 had levels ≥3.4 µg/L. Average mercury levels were even higher among Asian New Yorkers, and among foreign-born Chinese in particular. The NYC DOHMH found that 40% of Asians and 64% of foreign-born Chinese had blood mercury levels that exceeded EPA's reference dose. By comparison, the national HANES survey of women aged 16-49 during the period 1999-2002 found 5.7% with blood mercury levels ≥ 5.8 µg/L.

Women who reported consuming fish or shellfish 20 times or more in the last 30 days had 3.7 times the blood mercury concentration of women who reported no fish consumption.

**Recommended Patient Counseling on Fish Consumption:** Most of the adult NYC population

is believed to be at low risk for adverse effects from MeHg ingestion. Health care providers can counsel women who may become pregnant, pregnant women, breastfeeding mothers and young children (less than 6 years of age) on healthy fish consumption by advising them not to consume the fish known to be highest in MeHg. Providers can encourage frequent fish consumers to choose fish very low in mercury up to 5 servings a week. An appropriate adult serving size is 4-6 ounces. Recommended servings of particular fish species are found in the attached brochure.

Health care providers should:

- 1 Ask about fish consumption. “Do you eat fish? Does your child eat fish? What kinds and how much?”
- 2 Share the “Eat Fish, Choose Wisely” brochure with patients in the target populations.
- 3 Advise patients who are frequent consumers of fish high in mercury or who have elevated mercury levels to reduce exposure.
- 4 Emphasize that fish can still be eaten, although changes may be needed with regard to portion size, type of fish selected and the frequency of meals.
- 5 Encourage the choice of appropriate species of fish and serving size, rather than advising a general reduction in the number of fish meals.

**Testing is Not Recommended as a Screening Tool for Methyl Mercury Exposure Unless Very High Mercury Levels are Suspected:** The potential harms of unnecessary testing for methyl mercury include false-positive results, anxiety and financial costs. Although the exact magnitude of these known and potential harms is uncertain, they should be considered when deciding whether to test. Additionally, blood mercury levels may vary widely with recent fish consumption and may not be indicative of ongoing exposure.

After obtaining a thorough fish consumption history, consider measurement of a blood mercury level in patients with symptoms consistent with exposure to methyl mercury. Symptoms from very high exposures are typically neurological and may include visual disturbance, ataxia, paresthesias, hearing loss, dysarthria, mental deterioration, muscle tremor and movement disorders. Use only New York State Department of Health CLEP certified laboratories for the analysis of blood mercury levels. Report mercury levels  $\geq 5\mu\text{g/L}$  in blood to NYC Department of Health and Mental Hygiene within 24 hours as required by NYC health code (24 RCNY §11.03).

**Advise Patients Who Are Frequent Consumers of Fish High in Mercury or Who Have Elevated Mercury Levels to Reduce Exposure:** The best treatment to reduce exposure is removal of the exposure source. Provide patients counseling on healthy fish consumption as described above. For patients with an elevated blood mercury level, consider retesting four or more weeks following cessation or reduction in fish consumption. Follow-up testing is important in confirming the source of exposure, verifying exposure reduction, and reassuring anxious patients.

There is no chelating agent approved by the US Food and Drug administration for the treatment of MeHg poisoning. Evidence demonstrating the utility of chelation therapy for MeHg poisoning is limited. Chelation should be avoided in women who are or might become pregnant

due to the risks of adverse effects on the fetus. The potential adverse effects of chelation outweigh any small declines in blood mercury levels that can be achieved.

Elevations in blood mercury levels are rarely from sources other than fish. Advice for assessing exposures to other sources of mercury is available at [www.nyc.gov/html/doh/html/epi/mercury](http://www.nyc.gov/html/doh/html/epi/mercury).

Attached is a copy of the DOHMH brochure “Eat Fish, Choose Wisely”.

Sincerely,

*Daniel Kass*

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Assistant Commissioner  
Environmental Surveillance and Policy

*Nathan Graber*

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Director  
Environmental & Occupational Disease  
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### **Information Resources**

- 1 Call 3-1-1 to obtain copies of the brochure “Eat Fish, Choose Wisely”. Multiple copies may be ordered for offices. Brochures are also available in Spanish and Chinese.
- 2 Find a NYS laboratory certified to analyze specimens for mercury by calling 518-485-5378 or visiting [www.wadsworth.org/labcert/lep/CategoryPermitLinks/CategoryListing.htm](http://www.wadsworth.org/labcert/lep/CategoryPermitLinks/CategoryListing.htm).
- 3 Report mercury levels  $\geq 5\mu\text{g/L}$  in blood to DOHMH by faxing test results to 212-788-4299.