Consensus Statement on Methylmercury and Public Health

See list of participating organizations at the end

As organizations representing medical and public health professionals, women, and advocates of children and families, we are concerned that the American public is not adequately protected from exposure to mercury in the environment. We call for immediate actions to protect the general public and vulnerable populations such as pregnant women and children, through stronger regulations to curb mercury emissions at their source, and through improved fish consumption guidance to reduce exposures.

I. Our Organizations Are Concerned About the Human Health Toll from Mercury Pollution.

Mercury threatens human health and child development. Scientific findings indicate that mercury is a significant threat to the fetus, infants, and young children. Exposure to methylmercury, the highly toxic form of organic mercury found in our environment and food, may adversely affect reproduction[1] and a variety of organ systems, including the cardiovascular system[2,3] and, in particular, the brain and central nervous system.[4] The developing brain is more susceptible to methylmercury exposure than are adult brains, and is most sensitive while *in utero*.[5] Methylmercury crosses the placenta easily and readily penetrates the fetal brain.[6] It is also secreted in breast milk, although the contribution of methylmercury exposure through lactation is not yet fully understood.[7]

High dose exposures to methylmercury during fetal development can result in low birth weight, small head circumference, severe mental retardation, cerebral palsy, deafness, blindness, and seizures.[8] Recent epidemiological studies have shown that children exposed to moderate or low levels of mercury before birth may also experience neurological and development impairment. Outcomes may include delayed walking, delayed speech, and decreased performance on tests of attention, fine motor function, language, visual-spatial abilities, and memory.[9,10,11]

The U.S. Environmental Protection Agency (EPA) has derived a "safe" level for mercury in the human body of 5.8 micrograms per liter (μg/L) of blood, and a reference dose (RfD) of 0.1 μg per kilogram of body weight per day.[12] The National Academy of Sciences (NAS) has endorsed EPA's RfD, calling it a "scientifically appropriate level for the protection of public health."[13]

The American public is exposed to methylmercury at unacceptable levels. Mercury released from various industrial sources eventually deposits in water bodies, where it is converted to methylmercury through microbial action and accumulates in many edible fish species. Most Americans' exposure to methylmercury comes through contaminated fish. Virtually all freshwater and ocean fish and shellfish are contaminated to varying degrees, and the range of methylmercury levels commonly found in these foods include some that pose a health risk to the public.[14]

The Centers for Disease Control and Prevention (CDC) found in January 2003 that nearly eight percent of women of child bearing ages (16 to 49) are exposed to levels of mercury that exceed the EPA RfD, considered safe for a fetus.[15] A more recent analysis by EPA scientists raised that

estimate to more than 15% of women, based on peer-reviewed studies showing that cord blood concentrates mercury at significantly higher levels than maternal blood.[16] Using 2000 census figures to extrapolate across the entire U.S. population, this could mean that as many as 630,000 newborns each year are at risk of serious congenital neurological and developmental impairment.

The American public is not adequately protected from mercury pollution. Available data suggest that human activities have increased levels of mercury in the atmosphere by roughly a factor of 3, average deposition rates by a factor of 1.5 to 3 and deposition near industrial areas by a factor of 2 to 10.[17] Major identified sources of mercury pollution in the United States include coal-fired power plants, industrial boilers, municipal and medical waste incinerators, and chlorine manufacturing (chlor-alkali) facilities.[18]

While mercury emissions from various sources may be transported long distances in the atmosphere, local mercury sources play an important role in local pollution. Draft EPA modeling indicates that at mercury "hotspots" within the United States (locations where mercury deposition is highest), local emission sources within a state can be the dominant source of deposition. In addition, a recent 10-year study by the state of Florida points to the importance of local mercury pollution sources and the feasibility of measures to protect public health. In that study, strict emission limits applied to incinerators in south Florida were found to produce emissions reductions of 99% and corresponding reductions in mercury levels in Everglades fish and wildlife of 60%.[19]

As states have recognized the problem posed by mercury in their waters and developed improved monitoring programs, public health warnings designed to minimize the public's exposure to methylmercury-contaminated fish and shellfish have increased dramatically. State-level fish consumption advisories for mercury are up from 899 in 1993 to 2,140 in 2002 (an increase of 138 percent in total); more than 12 million lake acres and 473,000 river miles in 44 states were under advisory for methylmercury in 2002.[20] At the federal level, however, consumption guidance from EPA and the Food and Drug Administration (FDA) has been fragmented, incomplete, and sometimes contradictory. In July 2002, and again in December 2003, FDA's own Food Advisory Committee recommended that existing federal guidance be strengthened to sufficiently protect public health and vulnerable populations.[21]

II. We Call on Federal, State, and Tribal Leaders to Do More to Protect Public Health from Mercury.

In light of the serious public health threat posed by exposure to methylmercury, particularly to the fetus, infant, and young child, and acknowledging the scientific consensus which supports major reductions in industrial mercury emissions as quickly as possible, we call for immediate actions to remediate the threat of mercury exposure. Therefore, policy makers at all levels should:

1. **Treat mercury emissions from all anthropogenic sources as "hazardous," and rapidly implement regulations aimed at attaining the maximum achievable emissions reductions;**

2. **Employ protective and uniform emission limits for anthropogenic mercury sources in all communities, with no trading of mercury emissions among sources;**
3. **Develop comprehensive consumption guidelines for mercury in fish and seafood that is scientifically based and aimed at ensuring that 98% or more of the population – particularly women of reproductive age and children – is within EPA's "safe" level of methylmercury exposure; and**
4. **Cooperate internationally to reduce the global problem of mercury contamination by addressing mercury sources in all countries.**

Organizations endorsing this statement as of March 15, 2004

American Academy of Pediatrics
American Association on Mental Retardation
American Nurses Association
American Public Health Association
Association of Reproductive Health Professionals
Physicians for Social Responsibility
Children's Environmental Health Network
National Association of City and County Health Officials

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[1] Choy CM, Lam CW, Cheung LT, Briton-Jones CM, Cheung LP, Haines CJ. Infertility, blood mercury concentrations and dietary seafood consumption: a case-control study. BJOG*: an International Journal of Obstetrics and Gynecology*. 2002:109:1121-5.
[2] Yoshizawa K, Rimm E B, Morris JS, Spate VL, Hsieh CC, Spiegelman D, Stampfer MJ, Willett WC, 2003. Mercury and the risk of coronary heart disease in men, *N Engl J Med*. 2002: 28;347(22):1755-60.
[3] Gualler E, et. al, Mercury, fish oils, and the risk of myocardial infarction, *N Engl J Med.* 2002:347:1747-54.
[4] Sanfeliu C, Sebastia J, Cristofol R, Rodriguez-Farre E. Neurotoxicity of organomercurial compounds. Neurotox Res. 2003;5(4):283-305.
[5] Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. http://www.atsdr.cdc.gov/toxprofiles/tp46.html
[6] Myers GJ, Davidson PW. Prenatal methylmercury exposure and children: neurologic, developmental, and behavioral research. Environ Health Perspect. 1998 Jun;106 Suppl 3:841-7.
7 Sakamoto M, et al. Declining risk of methylmercury exposure to infants during lactation. Environ Res. 2002 Nov;90(3):185-9.
[8] Kondo K. Congenital Minamata disease: warnings from Japan's experience. J Child Neurol. 2000 Jul;15(7):458-64.
[9] Grandjean, P., et. al. Cognitive deficit in 7-year-old children with prenatal exposure to methylmercury, *Neurotoxicology and Teratology*, 1997: 19(6):417-428.
[10] Grandjean, P., et al., Methylmercury neurotoxicity in Amazonian children downstream from gold mining, *Environmental Health Perspectives*. 1999:107(7):587-591.
[11] Steuerwald, U, et al. Maternal seafood diet, methylmercury exposure, and neonatal neurologic function. J Pediatr. 2000 May;136(5):599-605.
[12] U.S. EPA, 1997a. Mercury Study Report to Congress, Volume V: Health Effects Of Mercury And Mercury Compounds. EPA-452/R-97-007.
[13] Committee on the Toxicological Effects of Methylmercury, Board on Environmental Studies and Toxicology, National Research Council, National Academy of Sciences. Toxicological Effects of Methylmercury. 2000.
[14] U. S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Seafood. Mercury Levels in Seafood Species. May 2001. http://www.cfsan.fda.gov/~frf/sea-mehg.html.
[15] Schober SE, et al. Blood mercury levels in US children and women of childbearing age, 1999-2000. JAMA 2003:289(13);1667-1674.

[16] Mahaffey KR. Methylmercury: Epidemiology Update. Slide presentation given at the National Forum on Contaminants in Fish. San Diego, CA. January 26, 2004. Accessed online March 1, 2004. http://www.epa.gov/waterscience/fish/forum/2004/presentations/monday/mahaffey.pdf.

[17] From UNEP Global Assessment of Mercury, 2003 http://www.chem.unep.ch/mercury/Report/Key-findings.htm

[18] U.S. EPA, 1997a. Mercury Study Report to Congress, Volume II: An Inventory of Anthropogenic Mercury Emissions in the United States. EPA-452/R-97-004.

[19] Florida Department of Environmental Protection. Integrating Atmospheric Mercury Deposition and Aquatic Cycling in the Florida Everglades: An approach for conducting a Total Maximum Daily Load analysis for an atmospherically derived pollutant, Integrated Summary, Final Report. October 2003. http://www.floridadep.org/labs/mercury/index.htm.

[20] U.S. EPA, Office of Water. Update: National Listing of Fish and Wildlife Advisories. May 2003. EPA-823-F-03-003. http://www.epa.gov/ost/fish

[21] U. S. Food and Drug Administration. Minutes of the FDA Food Advisory Committee Meeting on Methylmercury. July 23-25, 2002. http://www.fda.gov/ohrms/dockets/ac/02/minutes/3872m1.pdf.