

**Seeking Environmental Justice:  
The Global Mercury Crisis Threatens Those Least Able to Protect Themselves**

By Michael Bender, Director

Mercury Policy Project ~ [www.mercurypolicy.org](http://www.mercurypolicy.org) ~ +802.223.9000

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Mercury pollution and exposure compromises the most basic human rights—uncontaminated food, work in safe environments, health, and the rights of peoples to preserve traditional ways of life. These basic rights are threatened by the haphazard use, release, exposure and resulting buildup of mercury in the environment, and up the food chain into fish, wildlife and people.

People in developing countries, indigenous communities—and poor and disadvantaged people the world over—experience a disproportionate mercury pollution burden. This disproportional exposure often results from industrialized nations exporting their excess mercury, outdated industrial processes and toxic products to nations with weaker environmental regulations and lack of awareness of how harmful mercury is.

Economically viable alternatives to mercury exist for almost every known human use. Control technologies and conservation strategies are available that would reduce releases from the largest source of mercury pollution—coal-fired power plants.<sup>i</sup> Nevertheless, global releases of mercury to the environment continue to grow dramatically. Recognizing the immediate threat from mercury posed to millions of people on all continents, 150 experts concluded at the United Nations Environment Program Global Mercury Assessment meeting in September 2002 that *“there is sufficient evidence of significant global adverse impacts to warrant international action to reduce the risks to human health and the environment arising from the release of mercury into the environment.”*<sup>ii</sup>

While most mercury released into the environment is in the form of elemental or inorganic mercury, it is organic mercury—in particular, methylmercury—that poses the greatest threat to people and wildlife. A potent neurotoxin, exposure to methylmercury impairs the brain, kidneys and liver, and causes developmental problems reproductive disorders, disturbances in sensations, impairment of speech and vision, hearing and walking, mental disturbances, and death.<sup>iii</sup> Methylmercury concentrates in fish tissue, becoming increasingly potent in predatory fish and fish-eating mammals, and sometimes reaching toxic levels over a million times greater than the surrounding waters.<sup>iv</sup>

Mercury contamination poses the greatest danger to communities and populations least capable of protecting themselves. This includes:

---unborn babies and young children, who deserve the basic right to be born into the world and to grow up without threat of being poisoned. Both pre- and post-natal mercury exposure from fish is linked to impaired development of the infant’s nervous system.<sup>v</sup> A population study conducted in the Faroe Islands demonstrated that children born to mothers who consumed mercury-contaminated whale meat during pregnancy, exhibited cognitive delays and irregular cardiovascular development.<sup>vi</sup>

---indigenous communities who rely on fish and other wildlife for their basic survival and whose subsistence livelihoods are protected under universal human rights covenants.

--- the world's poor, who often subsist on fish and, in many countries, make use of mercury in artisanal gold mining and other practices that are part of the so-called "informal" sector—an entire portion of the population living without the support of social services and for whom the risks of mercury pollution go largely unrecognized.

Over the past half-century, numerous large scale exposure epidemics in places like Japan Iraq, South Africa, India and Peru have provided the scientific community all too many opportunities to study the effects of methylmercury on human health. This body of research has clarified what many had long feared: human health is compromised by significantly smaller concentrations of mercury than ever imagined. Accordingly, our understanding of so-called safe exposure levels has become more precise. In 1991, the World Health Organization (WHO) concluded that *a safe level of mercury exposure below which no adverse effects occur has never been established.*<sup>vii</sup>

From the Arctic to the Amazon, mercury's propensity to bioaccumulate in the environment is particularly threatening to indigenous communities. Adults in fish-eating indigenous communities frequently consume as much as of 40 to 60 micrograms of mercury per day from predatory fish contaminated by pollution from artisanal gold mining —about 6 to 10 times the international average consumption. In one Inuit community in Baffin Island, Canada, more than 50 percent have mercury levels in their daily diet of seal, walrus and narwhal blubber that exceed the WHO's guidelines for tolerable daily intake. People with the highest intake have mercury levels six times higher than the provisional tolerable weekly intake of mercury.<sup>viii</sup>

In addition to women, children and indigenous communities, a recent Finnish study links cardiovascular risks to mercury exposure through contaminated fish. Among middle-aged men in Finland, patients who consumed greater than 30 g/day fish had 56% higher mean hair Hg content than controls who consumed less than 30 g/day fish. The higher consumption and subsequent higher hair-mercury levels were associated with a 2-fold increase of risk of acute myocardial infarction and coronary heart disease.<sup>ix</sup>

For cultural and other reasons, certain groups like Asian Americans and Indigenous tribe in the US and around the world have been more impacted due to higher rates of fish consumption than the general population, thereby increasing their exposure. As a result, the human health consequences of mercury pollution—particularly the worst cases—tend to fall disproportionately on these communities. For example, among the general population, mercury pollution is estimated to cause typical IQ losses of between 1.60 and 3.21 points. Among the Great Lakes Indigenous tribes, however, the estimate of typical IQ losses from mercury pollution range from 6.2 to 7.1 points.<sup>x</sup>

However, among many of these groups, reducing or curtailing consumption of certain fish species is not a realistic option. This concern is especially acute during these difficult economic times, as more and more people consider fishing as a way to put food

on the table for themselves and their families. In this way, mercury pollution can impose costs on certain populations by increasing food insecurity.

Some groups also suffer unique cultural costs as a result of mercury pollution. Fishing is central to the culture of many Indigenous tribes like the Aroostock Band of Micmacs in Maine and is reflected in their ceremonies, language and song. To the extent that members of these tribes have had to stop consuming fish for health reasons, these cultural practices are not being passed on to future generations and risk being lost forever. Similarly, when mercury pollution harms animal species like the loon and mink—which serve as important clan symbols for the Minnesota Chippewa tribe—it is more than just environmental cost; it is also a affront to tribal identity and dignity.<sup>xi</sup>

Mercury use spans many industries and continents, including chlor-alkali production, health care and consumer products, primary mercury mining, cement kilns, PVC production and dental clinics. However, the world's most severe mercury-related occupational exposure crisis is happening far from the focus of any media attention. Millions of people engaged in artisanal and small scale gold mining (ASGM) use mercury to extract gold from unwanted sediment. Bonded gold-mercury amalgam is then heated with an intense flame to burn off mercury, directly exposing miners and bystanders to deadly elemental vapors. Around 1,000 tonnes of mercury are used in ASGM each year by between 10-15 million miners in 40-50 developing countries, emitting around 350 tonnes of mercury into the air, and contaminating themselves, their families and communities and the environment. This mercury methylates after mixing with organic matter—bioaccumulates in fish and contaminate food supplies globally.<sup>xii</sup>

In broad terms, widespread mercury contamination comes from three types of sources:

- 1) direct human use, which includes mining, industrial, and post-consumer waste and emissions;
  - 2) indirect releases emitted from the burning of fossil fuels and other anthropogenic sources;
  - 3) re-releases of mercury from prior human activities and 4) “natural” processes.
- Overwhelmingly, harmful releases of mercury to the environment are now coming from human activity.

Mercury levels around the globe can only be expected to dramatically rise if the pattern currently being followed remains unchecked. In China alone mercury emitted from coal fired power plants is expected to double or triple by 2020 as the country's national electrification program hits full stride, with a new power plant going on line every week.<sup>xiii</sup> Of the 6,000 metric tonnes of mercury entering the environment annually, some 2,000 tonnes comes from coal-fired power stations and coal fires in homes. Once in the atmosphere or released down river systems, the toxin can travel for thousands of miles. Without the employment of an effective control strategy, expanding coal use will dramatically increase worldwide mercury emissions.<sup>xiv</sup>

This is both disturbing and promising: for while the bad news is that humanity has waited far too long to respond to a problem of its own making, the good news is that a dramatic reversal of the U.S. position on worldwide mercury pollution has now paved the way for the development of a globally binding treaty on mercury. During the February 2009 United Nation Environment Program Governing Council meeting in Nairobi, Kenya, 120 countries supported the development of a legally binding agreement on mercury, scheduled to be signed in 2013.<sup>xv</sup>

Only a legally binding international instrument can require differentiated responsibility to all state-actors and prevent the unjust transfer of mercury from the developed to the developing world. Voluntary and aspirational international targets are insufficient: *no single country can resolve the mercury problem on its own. There are alternatives to mercury, but there is no alternative to international cooperation.*

Clearly, in order to create a healthy environment for future generations, we must stop the circle of poison that continued mercury use, recycling, and release perpetuates. While individual countries can and have made progress in reducing mercury releases, no one country can solve the global mercury problem by itself—international cooperation is essential. Through the work of a United Nations Intergovernmental Negotiating Committee over the next four years, a concerted, comprehensive, negotiated, global agreement must dramatically help curb releases of mercury to the environment and potentially avert a global human rights, health and ecological crisis.

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<sup>i</sup> Bureau of Waste Prevention, Division of Planning and Evaluation, Massachusetts Executive Office of Environmental Affairs and Department of Environmental Protection, "Evaluation of the Technological and Economic Feasibility of Controlling and Eliminating Mercury Emissions from the Combustion of Solid Fossil Fuel, Pursuant to 310 CMR 7.29-Emissions Standards for Power Plants, Dec 2002.

<sup>ii</sup> <http://www.chem.unep.ch/mercury/Report/Final%20Assessment%20report.htm>

<sup>iii</sup> Environmental Protection Agency (US). Mercury study report to Congress. Washington,EPA. Pub.No.: EPA/600/P-97/002Ab.

<sup>iv</sup> Zillious, E.J., Porcella, D.B., Benoit, J.M., "Mercury Cycling and Effects in Freshwater Wetland Ecosystems," *Environmental Toxicology and Chemistry* 12 (1993), pp.2245-2264.

<sup>v</sup> Sorenson N, Murata K, Budtz-Jorgenson E, Weihe P, Grandjean P. Prenatal methylmercury exposure as a cardiovascular risk factor at seven years of age. *Epidemiol* 1999;10:370-5.

<sup>vi</sup> Grandjean et. al., 1997.

<sup>vii</sup> World Health Organization(WHO),1991, Environmental Health criteria 118, Inorganic Mercury, WHO, Geneva;

<sup>viii</sup> "Pollutants threaten Artic wildlife, Inuit," *SeaWeb Ocean Update*, September 1997.

<sup>ix</sup> Salonen et al., 1995

<sup>x</sup> Catherine A O'Neill, *Environmental Justice in the Tribal Context: A Madness to EPA's Method*, 38 *ENVTL. L.* 495, 531 (2008)

<sup>xi</sup> O'Neill, *supra* note 19, at 496-97, 509-13

<sup>xii</sup> [http://www.chem.unep.ch/MERCURY/awareness\\_raising\\_package/E\\_01-16\\_BD.pdf](http://www.chem.unep.ch/MERCURY/awareness_raising_package/E_01-16_BD.pdf)

<sup>xiii</sup> Pacyna,E.G., & Pacyna, J.M., *Global Emission of Mercury from Anthropogenic Sources in 1995*, Norwegian Institute for Air Research, P.O. Box 100, 2027 Kjeller, Norway

<sup>xiv</sup> Miller,S., Dunham,G., and Olson,E., "Worldwide Mercury Control Strategy for Coal," *Mercury as a Global Pollutant-5<sup>th</sup> International Conference*, May 23-28, 1999, Rio de Janeiro, Brazil

<sup>xv</sup> U.N. Environment Program Governing Council Decision 25 on mercury (starting on p.20):

[http://www.chem.unep.ch/MERCURY/GC25/GC25Report\\_English\\_25\\_5.pdf](http://www.chem.unep.ch/MERCURY/GC25/GC25Report_English_25_5.pdf)