The Minamata Convention On Mercury: Past, Present, And Future Environmental Health

Maggie Coulter
American University Washington College of Law

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THE MINAMATA CONVENTION ON MERCURY: 
PAST, PRESENT, AND FUTURE ENVIRONMENTAL HEALTH

by Maggie Coulter*

INTRODUCTION

In October 2013, nearly six decades after health officials first noted victims suffering from unregulated discharges of methylmercury in Minamata, Japan, parties signed the Mercury Convention.1 An international treaty designed to protect human health and the environment from anthropogenic releases and emissions of mercury and mercury compounds, the Minamata Convention on Mercury is the newest multilateral environmental agreement registered with the United Nations.2 Currently, the Convention has 96 signatories and only one ratified party, the United States.3 When it enters into force, however, the costs and difficulty of implementation may dilute the benefits of this new global monitoring system. This feature describes the origins of the Convention and potential implementation problems and concludes that despite these difficulties, the creation of a global risk assessment for mercury, if properly implemented, will be invaluable in protecting environmental health worldwide.

ORIGINS

The negative human health effects of mercury contamination and poisoning have been well-documented since the 1970s.4 But not until the occurrence of large-scale public health catastrophes did the global community gain awareness of this issue. The emergence of a strange and un-diagnosable ailment in the fishing village of Minamata, Japan in 1956 which came to be known as “Minamata disease” was the first and most well-known of the mercury-caused public health emergencies that emerged over time.5 For many years, however, the cause of this “disease” was unknown; there is much controversy regarding the Japanese government’s response to the outbreak of this “disease.” It was not until 25 years after the first outbreak that the Japanese government finally acknowledged that releases of an unwanted byproduct (methylmercury) of chemicals manufacturing offshore into the ocean by the Shin Nippon Chisso Hiryō chemical plant were the source of the mysterious ailments that afflicted the community.6

Victims of Minamata disease who ingested the methylmercury—a potent neurotoxin now known to accumulate into highly toxic doses in the food chain7 and cause brain damage and birth defects8—have struggled to get the Japanese government to recognize the pollution disaster as well as obtain compensation from the polluting chemical facility.9 As of March 2001, 2,265 victims have been officially recognized by the Japanese government (of whom 1,784 have died) and over 10,000 people received financial compensation from Chisso.10 The number of victims, however, varies widely between reporting in government sources and the studies conducted by the local community. Further, calculating the number of victims to begin with is even more difficult because symptoms of mercury poisoning often do not manifest until later in life, and varying degrees of affliction result from varying levels of exposure.11

In the village of Minamata two different museums documenting and memorializing the public health catastrophe portray vastly different pictures of Minamata disease, one reflecting the government perspective, the other the villagers’.12 Further evidence of the distance between local and government perspectives on mercury poisoning in Minamata is the fact that the Japanese government lobbied aggressively to have the new mercury treaty bear the name of the village, whereas the villagers in Minamata vehemently opposed including their city’s name in the title.13

FUTURE RESEARCH AND DATA COLLECTION

The Minamata Convention on Mercury is a multilateral environmental agreement designed to regulate and reduce anthropogenic emissions and releases of mercury primarily to prevent public health catastrophes like that which occurred in Minamata, Japan.14 The treaty’s goals include “curbing mercury poisoning in Minamata” and “phasing down” the use of mercury in dental amalgams, and closing all mercury mines within 15 years after the convention takes effect.”15 Many of the convention’s goals, however, are essentially voluntary, qualified by the phrase “where feasible,”16 which may prevent attainment of these goals. Going forward, the Convention does place significant emphasis on research and information sharing among parties with emphasis on clarifying how mercury enters and moves through the environment.17 Recently emerging scientific evidence that global climate change and ozone depletion compound the effects of methylmercury concentration further complicates this question.18

MINIMATA: A GLOBAL RISK ASSESSMENT TOOL?

One important benefit of a global monitoring system for methylmercury assessment is that data from less developed or poorer countries will be taken to bear when determining global risk of pollutant exposure.19 For instance, impacts on fishermen in small villages like Minamata where methylmercury accumulation in fish and ocean sediment cause greater instances of poisoning will be incorporated into risk assessments by national governments and larger chemical corporations. Additionally,
a global risk assessment will bring many different sources of pollution together in one analysis. For methylmercury, this is particularly important since initial emissions (such as the discharge of effluent waste by the Shin Nippon Chisso Hiryo chemical plant) is often less detrimental than the re-emission of accumulated pollutants from the atmosphere or ocean sediment.20 Last, a global assessment would address the interplay of global problems like climate change and the deterioration of the earth’s ozone layer with methylmercury pollution.21 As global warming and ozone deterioration compounds methylmercury issues, a global assessment can better address the accumulation of methylmercury pollution.22

The largest problems Parties of the Mercury Convention will face are those of implementation.23 First, Party-states must supply all data collected under the forthcoming regime to a secretariat of the Convention, after which the data must be verified.24 This “trust but verify” implementation has the advantage of a dual layer of accountability, but has the disadvantage of redundancy.25 The consequent implementation of national monitoring systems and then a second layer of independent, unbiased monitoring will vastly increase its cost. Further, many of the existing data collection systems are outdated even in developed countries or simply do not yet exist in poorer countries.26 Adapting existing monitoring technology, as well as developing new technologies where they are lacking will come at a significant cost.27 Moreover, though the Convention includes language that calls on wealthier nations to assist poorer ones to aid in developing their data-gathering capacities, as of yet there is no concrete fund-sharing program.28

The final disadvantage of the Minamata Convention’s global assessment lies in determining what the new data-collection regime will actually measure.29 Which populations it should measure requires choosing between poor populations with high exposure rates where data collection is expensive and already established collection centers in developed countries.30 Additionally, which sources of mercury pollution should be measured range from volcanoes, direct pollution like the effluent from the Shin Nippon Chisso Hiryo chemical plant in Minamata, and even more nebulous re-emissions.31 Finally, further research regarding the type of human measurements is necessary.32 Choices range from more invasive blood collection and analysis, to less invasive breast milk and urine sampling.33 In all instances, however, Convention implementers must choose and then employ collection methods uniformly. And although the implementing Parties of the Convention can look to other successful pollutant-based conventions for guidance, like the Stockholm Convention on Persistent Organic Pollutants which addresses ozone depletion, mercury pollution presents unique issues all its own which will require even more uniquely tailored responses.34

**Conclusions**

The benefits of the Minamata Convention’s global monitoring system are few but important when compared to the difficulty and expense of implementation. Access to a global risk assessment is essential in determining a sound, science-based global policy on mercury pollution. If the expense and difficulties of implementation can be overcome, a global assessment is a valuable tool for creating policy, particularly one that must be streamlined across the globe in order to be effective. Reflecting on the global data-collection regime of the Stockholm Convention, the significant successes of such a global risk assessment reflect that future use of such a tool, if properly and effectively implemented, is invaluable.

Effective global implementation of the Minamata Convention, however, will also need to rely on state-specific and local policy development which may be obscured in a global risk assessment. Proper implementation cannot discount the importance of state-specific responses to pollution on a local level. Combining both local data collection and a global risk assessment will be essential for the Parties to effectively implement the global data collection and assessment regime envisioned by the Minamata Convention.

**Endnotes: The Minamata Convention on Mercury: Past, Present, and Future Environmental Health**


3. The United States is currently the only party to have ratified the Convention primarily because during negotiations it lobbied aggressively for the Convention to mirror its already existing internal domestic laws regulating mercury. Thus, when the United States signed the Convention, it was already in compliance with all of the treaty’s obligations. See Global Treaty on Mercury Pollution Gets Boost from United States, Minamata Convention on Mercury (Nov. 7, 2013), http://www.mercuryconvention.org/News/GlobalTreatyonMercuryPollutionGetsBoostfrom/tabid/3524/Default.aspx.


6. Normile, supra note 4, at 1446–47.

7. Bioaccumulation of highly toxic mercury in fish and shellfish in Minamata Bay and the Shiranui Sea resulted in mercury poisoning for the villagers of Minamata when they ate the contaminated fish. See David P. Krabbenhoft & Elsie M. Sunderland, Global Change and Mercury, 341 SCIENCE 1457, 1458 (2013). Furthermore, the bioaccumulation of mercury in the waters offshore of Minamata persists, and many villagers in the primarily fishing-based village continued on page 46.

94 OECD, supra note 1, at 150; Oslo Manual, supra note 2, at 78.


96 REACH Innovation Report, supra note 41, at 77.

97 REACH Innovation Report, supra note 41, at 66.

98 REACH Innovation Report, supra note 41, at 19.

99 See Minamata Convention on Mercury, supra note 14, at art. 21 (outlining Parties’ reporting requirements).

100 Lubik & Malakoff, supra note 15, at 1443.

101 Krabbenhoff & Sunderland, supra note 7, at 1458.

102 See Lubik & Malakoff, supra note 15, at 1445 (explaining that Parties to the Minamata Convention could develop a coordinated database, similar to that developed under the 2001 Stockholm Convention on Persistent Organic Pollutants, to record biomonitoring and infrastructure data for mercury).

103 Lubik & Malakoff, supra note 15, at 1445.

104 Lubik & Malakoff, supra note 15, at 1443.

105 See Lubik & Malakoff, supra note 15, at 1445.

106 Lubik & Malakoff, supra note 15, at 1445.

107 Lubik & Malakoff, supra note 15, at 1445; see also Minamata Convention on Mercury, supra note 14, at art. 13 (outlining the Convention’s mechanism for sharing financial resources).

108 Lubik & Malakoff, supra note 15, at 1445 (“Countries still need to work out what kinds of data to collect . . .”).


110 See supra notes 19, 23 and accompanying text.

111 Lubik & Malakoff, supra note 15, at 1445.

112 Lubik & Malakoff, supra note 15, at 1445.

113 For example, unlike measuring ozone depletion, utilizing a variety of different methods or sample sources used to measure mercury may skew results. Lubik & Malakoff, supra note 15, at 1445 (“An alternative [to blood samples] might be gathering hair or urine samples, but recent research has shown that each might accumulate a different record of mercury exposure, potentially skewing results.”).

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have lost their livelihoods. Minamata Disease Archives: Pathway of Methyl-mercury from Factory to Human, JAPAN MINISTRY OF ENV’T (2014), http://www.nimd.go.jp/archives/english/tenji/a_corner/a06.html.


9 Normile, supra note 4, at 1447.

10 Normile, supra note 4, at 1447. The Japanese government has recognized 2,265 victims of methylmercury poisoning; however, many people who suffered from smaller exposures to the toxin or have lesser health effects still go unrecognized. Id.

11 Normile, supra note 4, at 1446.


16 Id.

17 Id. at 1443-44.

18 Krabbenhoff & Sunderland, supra note 7, 1458.

Endnotes: RUBBER-STAMPED REGULATION: THE INADEQUATE OVERSIGHT OF GENETICALLY ENGINEERED PLANTS AND ANIMALS IN THE UNITED STATES continued from page 20


18 Fernandez-Cornejo, supra note 16, at 19 (explaining the act established the International Union for the Protection of New Varieties of Plants to ensure that breeders of new varieties of plants were provided with the appropriate intellectual property rights).


20 7 U.S.C. § 2543 (2011); USDA, supra note 19, at 19.

21 Diamond v. Chakrabarty, 447 U.S. 303 (1980) (deciding to extend patent rights to genetically engineered microorganisms, which are important tools and products of biotechnology, and strengthen the rights of breeders).


24 Fernandez-Cornejo, supra note 16, at 19 (noting that several rulings by the U.S. Patent Office extended intellectual property rights to a wide range of new biotechnology products such as seeds, plants, plant parts, genes, traits, and biotechnology processes).


27 Stroemke, supra note 7, at 9.