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Implementation of the Minamata Convention in the health sector: **challenges and opportunities**

Information note



Abstract

Mercury and its compounds are among the top priority chemicals of major public health concern globally. The Sixty-seventh World Health Assembly welcomed the adoption of the Minamata Convention on Mercury, which aims to protect human health and the environment from mercury, and agreed priority action for ministries of health and WHO. The role of health ministries will be critical in activities related to protecting health from the negative impacts of mercury through implementation of the Convention. This publication includes an analysis of the role of the health sector in, and the benefits expected from, the implementation of the Convention and the need for capacity-building to match its requirements. Implementation of the Convention globally is expected to result in significant benefits to public health, as well as related economic and social benefits, thus contributing to renewed sustainable development.

Keywords

MERCURY – adverse effects

MERCURY POISONING – prevention and control

ENVIRONMENTAL EXPOSURE – prevention and control

ENVIRONMENTAL HEALTH

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Abbreviations and acronyms

ASGM artisanal and small-scale gold mining
HBM human biomonitoring
UNEP United Nations Environment Programme

Introduction

The toxicity of mercury for human health has been long known, and the toxic effects of different forms of mercury have been extensively studied. In brief: elemental and methylmercury are toxic to the central and peripheral nervous systems; inhalation of mercury vapour can produce harmful effects on the nervous, digestive and immune systems, lungs and kidneys and may be fatal; and inorganic salts of mercury are corrosive to the skin, eyes and gastrointestinal tract and may, if ingested, induce kidney toxicity (1). Of particular concern is the toxicity of mercury for the developing organism, with well-documented neurodevelopmental effects of exposure to (methyl) mercury *in utero* and in early life (2). Because of its environmental ubiquity and persistence and adverse developmental effects observed at relatively low levels of exposure, mercury is one of the top priority chemicals of major public health concern globally (3). Exposure to all forms of mercury can contribute to the environmental burden of disease (2). Therefore, in order to reduce the burden of disease and to ensure better protection of the health of future generations, it is crucially important to address exposure to chemicals and wastes effectively, including those containing mercury, particularly in vulnerable populations such as pregnant women and children. This would also deliver economic benefits in terms of reduced costs from the impact of mercury on health.

An important step in this direction was taken in 2013 with the adoption of the Minamata Convention on Mercury. This global treaty aims to protect human health and the environment through controlling the anthropogenic releases of mercury throughout its life-cycle (4). Reaffirming the commitment of the health sector to play an important role in the

implementation of the Minamata Convention, the Sixty-seventh World Health Assembly welcomed the formal adoption of the Convention and agreed on priority actions for ministries of health and WHO (5).



The toxicity of mercury for the developing organism, with well-documented neurodevelopmental effects of exposure to (methyl)mercury in utero and in early life, is of particular concern.

In implementing the Convention, the dual responsibilities of the health sector as advocate for health-related aspects of the Convention on the one hand, and its obligations as a user of mercury-containing products on the other are inescapable. This paper addresses the needs and challenges inherent in the involvement of the health sector in the implementation of the Convention, as well as the opportunities arising from these activities.

Background

For the purpose of this publication, the authors analysed major reports and documents of WHO and other international organizations related to the health aspects of mercury issued in the last 10 years in the context of the role and responsibilities of the health sector in the implementation of the Minamata Convention.

Further input was provided by a pilot questionnaire survey organized as part of the preparations for a workshop on Health Sector Involvement in the Implementation of the Minamata Convention: Mercury Exposure Assessment and Prevention (held in Bonn, Germany, in 2015) (6). The survey aimed to investigate the needs for capacity building in the health sector in the WHO European Region. Using the Survey Monkey online tool, experts from 10 Member States responded to 10 questions on the implementation of the Convention in their countries, including the following questions related to capacity-building and technical support from WHO and the scientific community.

- 
1. What is the main concern about mercury and its compounds in your country?
 2. Which activities that should be implemented by the health sector require a strengthening of your country's capacities?
 3. What are the priority activities for implementation of the Convention in the health sector at national level?
 4. What kind of assistance is needed from WHO?
- 

Questionnaire to assess countries needs of capacity building for the implementation of the Minamata Convention

1. Did your country sign the Minamata Convention?
Yes No Don't know
2. Are/were consultations for ratification of the Convention initiated at the country level?
Yes No Don't know
3. Is/was the health sector involved in the discussion of the Convention signature/ratification?
Yes No Don't know
4. What are the main concerns about mercury and its compounds in the country? (indicate all appropriate answers)
 - Air emissions (coal power plants, other industrial processes)
 - Use of mercury in as a raw material in industrial processes
 - Mercury-added products
 - Contamination of fish with methylmercury
 - Contaminated sites
 - Occupational exposure
 - Wastes management
5. What activities of the health sector require strengthening capacities to ensure the implementation of the Minamata Convention (indicate all appropriate answers):
 - Identification of exposed population groups and assessment of risks to human health
 - Replacement of mercury-added products in health care settings;
 - Management of mercury-containing hospital wastes;
 - Reduction of use of dental amalgams
 - Development of limits;
 - Public education and risks communication
 - Workers education and risks communication
 - Information (incl monitoring) collection and sharing
 - Health care and public health professionals education and training
 - Mercury poisonings treatment and control
 - Research and transmission of science to policies
6. What are priority actions for the Convention implementation in the health sector at the national level (indicate all appropriate answers):
 - Policy development
 - Legislation strengthening
 - Interagency coordination
 - Education and training
 - Awareness raising campaigns
 - Exposure and risks assessment
 - Alternatives promotion
 - Monitoring and surveillance
7. Are there any strategies/programs in the health sector in which mercury-related activities can be included (indicate all appropriate answers):
 - Strategies on sustainable development
 - Food safety
 - Occupational safety
 - "Healthy" health care settings, incl. medical wastes management
 - Hazardous wastes management
 - National human biomonitoring program
 - Scientific programs on environmental health
8. Are you aware about WHO guidance documents, scientific reports and other documents in relation to mercury and the Minamata Convention
Yes No Don't know
9. What kind of assistance is necessary from WHO (indicate all appropriate answers):
 - Guidance documents on exposure assessment, incl human biomonitoring
 - Guidance documents on strategy and policy development
 - Guidance for public and workers education and training
 - Safety limits
 - Clinical protocols for diagnosis and treatment
 - Information sharing and networking
 - Sharing information on case-studies
 - Trainings of target population groups

Questionnaire to assess countries needs of capacity building for the implementation of the Minamata Convention

The respondents represented 10 Member States characterized by: (i) different scales and intensities of mercury-related health and environmental problems, such as primary mining, coal burning, cement and metal production, the use of mercury-containing products and mercury-containing waste management; and (ii) achievements in prevention such as prohibition, control and monitoring of mercury and mercury-containing products.

The roles and priorities of the health sector and capacities needed for implementation of the Convention were discussed at the Bonn workshop by representatives of 21 European Member States and other organizations as well as WHO temporary advisers. The conclusions from the workshop contributed to the development of this publication.

Material for this publication was also derived from discussions during the WHO session at the 2015 International Conference on Mercury as a Global Pollutant held in the Republic of Korea on the translation from science to action with a focus on protecting human health from the adverse impacts of mercury and its compounds.




A range of preventive measures have begun in the health sector in many countries, including the banning of mercury-containing skin-lightening products and antiseptics as well as the removal of mercury thermometers in health care.

Role of the health sector in the implementation of the Minamata Convention


The protection of human health is at the core of the Minamata Convention (4). The health sector played a crucial role in the development of the Convention with the identification of the health effects and sources of exposure of mercury, assessment of the disease burden, setting of guidelines such as the tolerable dietary intake in food (7, 8) and guideline values in drinking-water (9) and air (10), as well as developing tools for action and guidance (11, 12). A range of preventive measures have begun in the health sector in many countries, including the banning of mercury-containing skin-lightening products and antiseptics as well as the removal of mercury thermometers in health care (13, 14).

The Convention includes a range of measures to meet its objectives, including control of emissions and releases of mercury to the environment from industrial sources, and the phasing out or phasing down of certain products or components of products that contain mercury or a mercury compound.

For the health sector, the central provision is Article 16 subparagraph 1, which calls for:



... a) the development and implementation of strategies and programmes to identify and protect populations at risk, particularly vulnerable populations, and which may include adopting science-based health guidelines relating to the exposure to mercury and mercury compounds; setting targets for mercury exposure reduction, where appropriate, and public education, with the participation of public health and other involved sectors; b) the development and implementation of science-based educational and preventive programmes on occupational exposure to mercury and mercury compounds; c) appropriate health care services for prevention, treatment and care for populations affected by the exposure to mercury or mercury compounds; and d) to establish and strengthen, as appropriate, the institutional and health professional capacities for the prevention, diagnosis, treatment and monitoring of health risks related to the exposure to mercury and mercury compounds (4).



Beyond Article 16, the involvement of ministries of health is essential for the success of a range of other measures in the Convention. These include the phasing-out of the manufacture, import or export by 2020 of mercury thermometers, sphygmomanometers and antiseptics used in health care as well as mercury-containing skin-lightening cosmetics, and the taking of measures for phasing down the use of dental amalgam in health care (Article 4). The health sector also needs to play a leading role in the development and implementation of public health strategies to reduce the impact on health of the use of mercury in artisanal and small scale gold mining (ASGM) (Article 7), as well as in assessing contaminated sites for risks to health (Article 12). Moreover, ministries of health will play a critical role in activities related to the exchange of information on health, public awareness-raising and research in and monitoring of health, in line with Articles 17, 18 and 19 of the Minamata Convention.


Support from the health sector for implementation of the Minamata Convention also stems from its classic role in: research on the impacts of risk factors on health and the effectiveness of interventions to address them; diagnosis and treatment; monitoring and reporting; the provision of authoritative guidance; and advocacy and education for patients, families, communities, vulnerable groups and health professionals.

In order to facilitate the health sector involvement in the implementation of the Minamata Convention, World Health Assembly at its 67th session in 2014, has adopted the Resolution 67.11 Public health impacts of mercury and mercury compounds: the role of WHO and ministries of public health in the implementation of the Minamata Convention (5).

Globally, mercury pollution originates from natural and anthropogenic sources, long-range transport, and widespread occurrence in the environment and in the food chain. In addition, there are different sources and conditions of occupational and environmental exposure. The measures envisioned under the Convention require, therefore, close cooperation between ministries of health and of the environment as well as other sectors such as labour, industry, the economy, agriculture and others responsible for the implementation of different aspects of the Minamata Convention. This multisectoral approach is in line with global and regional WHO policies (15, 16) and requires action from ministries of health to position WHO in the frame of the chemical safety agenda at national level (3, 5).



A close cooperation between ministries of health and of the environment as well as other sectors such as labour, industry, the economy, agriculture and others responsible for the implementation of different aspects of the Minamata Convention is important.



Phasing down the use of dental amalgam, especially in developing countries where it is still in use, requires the wide set of activities.

Needs for capacity-building in the health sector at national level

The effective protection of human health through the implementation of the Minamata Convention requires adequate capacities in the health sector at national level. The process of identifying the requirements for capacity-building and efforts to build such capacities needs to take account the dual nature of the involvement by the health sector, namely its responsibility in advocacy for health-related aspects of the Convention, and its obligations as a user of mercury-containing products.

To meet the objectives of the Minamata Convention and fulfil the responsibilities of the health sector as a user of mercury-containing products, adequate capacities should be established in ministries of health and in all other institutions relevant to the health system. In low- and middle-income countries the implementation of the Convention's public health components may prove more challenging owing to limited in-country resources and capacities.

For example, the phasing-out of mercury-containing thermometers and sphygmomanometers in health care requires the implementation of a number of activities. These activities involve availability of human and technical resources, including but not limited to: conducting an inventory to identify the number and uses of mercury-containing devices. In addition, it requires: evaluating alternatives; safe removal and disposition of mercury-containing devices; educating health care personnel and those who are involved in waste management; and maintaining and calibrating the alternative equipment as well as monitoring to ensure its effectiveness (12, 14).

Phasing down the use of dental amalgam, especially in developing countries where it is still in use, requires the wide set of activities. It should start with the promotion of alternatives to dental amalgam in dental restoration when clinically indicated. It is necessary to build the capacities among dentists for oral health promotion and disease prevention; the creation of awareness of the potential impacts on the environment of dental amalgam waste; support for best management practices and the environmentally sound management of waste. In addition, introduction of health care waste separation and the use of special facilities for hazardous waste storage and treatment is necessary. For all these activities the presence of regulatory frameworks and legislation is needed (17).

The pilot questionnaire survey conducted prior to the Bonn workshop revealed concerns about mercury and its compounds among all respondents. Out of 10 respondents, the majority (80%) were concerned about the use of mercury-containing products and waste management, followed by concerns about contaminated sites (70%). Emissions into the air and occupational exposure were mentioned as problems by 60% of respondents, while less concern was expressed about the replacement of mercury-added products (30%) and methylmercury in fish (20%). Mapping of capacity-building needs revealed that majority (70–100%) of respondents considered the identification of exposed population groups, management of mercury-containing medical wastes, education of the public and workers, risk communication, collection and sharing of information (including through human biomonitoring (HBM)), research and translation of knowledge into policies the main areas for health sector involvement. Furthermore, around 60% recognized the need for capacity-building for the reduction of dental amalgam use, development and enforcement of safety limits/guideline values for air, water, food and soil pollution, and education and training of health care providers and public health professionals. Less need was identified for diagnosis, treatment and reporting of mercury poisoning. Answering the question about priority action for implementation of the Convention in the health sector at national level, more than half of the respondents indicated the strengthening of interagency cooperation, followed by implementation of monitoring and surveillance, education and training, exposure and risk assessment and policy development. Overall, the results of the survey showed that the capacity-building needs in all participating countries covered practically all health-related aspects of mercury and its compounds.

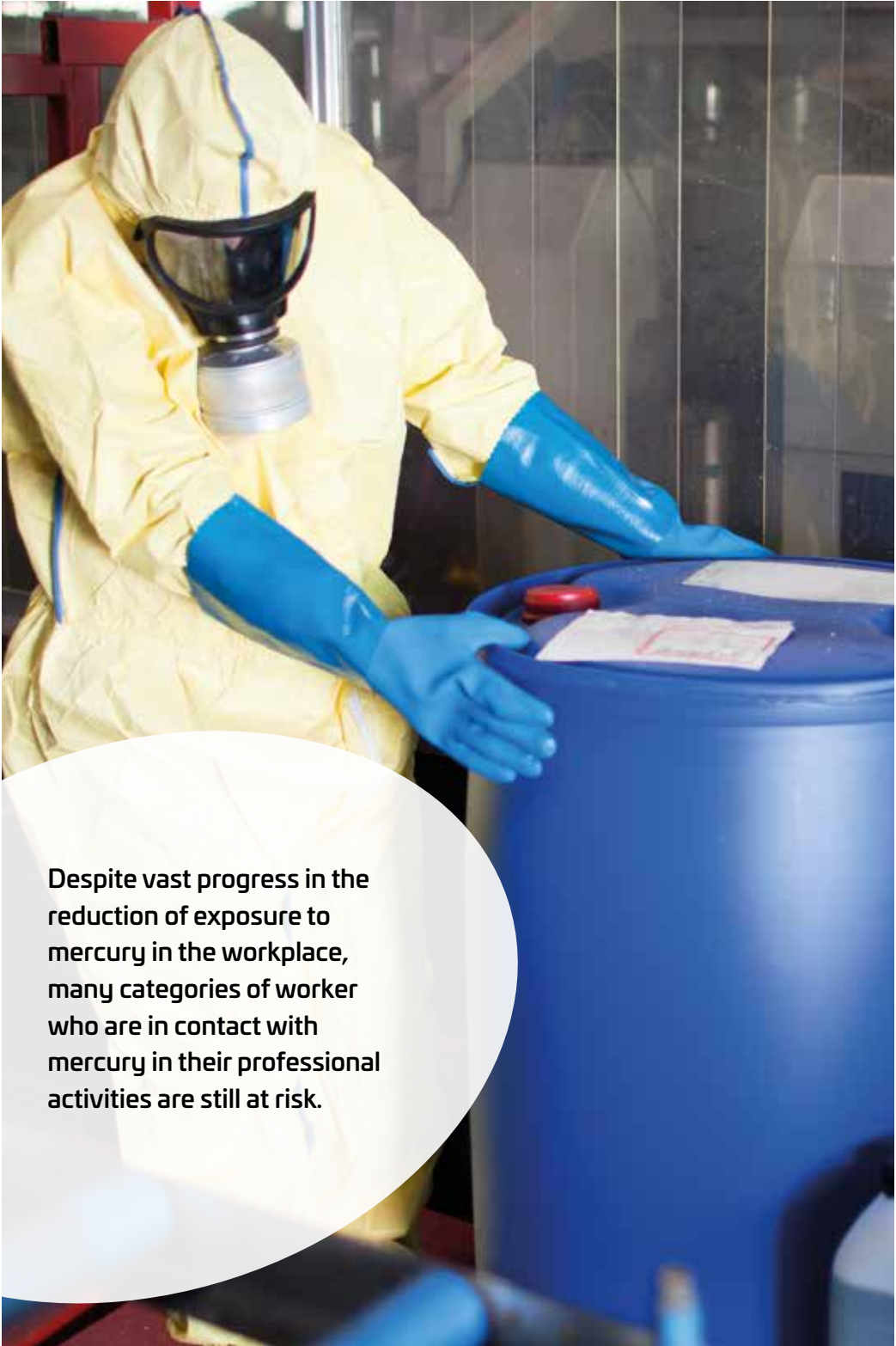
As a follow-up to the survey, national experts participating in the Bonn workshop identified several capacity-building priorities, including for the: establishment of HBM for assessment of environmental and occupational exposure to mercury; identification of chemicals by laboratory analysis; identification of exposed population groups and assessment of the health risk, followed by public education and risk communication; collection and sharing of information; management of mercury-containing medical waste; education and training for health care and public health professionals; and the need to deal with contaminated sites.

Issues related to capacity-building in the health sector have been reported consistently in various parts of the world. They should be taken into account when needs are assessed and action planned for implementation of the Minamata Convention globally. For example, similar needs have been recognized in countries involved in the implementation of international (multi- and bilateral) projects in Ghana and Mongolia (18, 19). The strengthening of institutional, governmental, scientific and educational capacities through the implementation of degree-granting educational programmes in public health, in-country research skills and projects and partnerships across stakeholder groups have been explored in Ghana in the context of protecting the population in ASGM areas. In Mongolia, the need for additional capacities has been identified to conduct health surveys and disseminate up-to-date findings to ASGM populations, provide convincing evidence that long-term ASGM activities affect the quality of life and have delayed effects on health, disseminate information about the risks to health, and provide rehabilitation services to ASGM populations.

Identification of populations at risk and assessment of the effectiveness of implementation of the Minamata Convention

It is essential to identify the population groups at risk so as to advocate for human health, prepare advice on protective and preventive measures in order to demonstrate the effectiveness of the Minamata Convention. Among the tools available to identify populations exposed to mercury, HBM is of prime relevance as an integrated measure of exposure. According to the United Nations Environmental Programme (UNEP) and WHO, measurements of mercury levels in biological matrices such as hair, blood, nails, milk -and urine can be “excellent indicators of various types of mercury exposures” (11).

HBM is key to understanding past and current human exposure to different contaminants, as well as for evaluating how the levels of contaminants change spatially and/or over time. Experts participating at several meetings organized by WHO reconfirmed the HBM as the most valuable method for assessing population exposure to mercury. (20–22).



Despite vast progress in the reduction of exposure to mercury in the workplace, many categories of worker who are in contact with mercury in their professional activities are still at risk.

HBM of mercury in occupational settings has been internationally established for decades and has been given an impetus by the need to meet the demands of occupational health protection, including in low-exposure situations. It is a reliable tool for the quantitative analysis of workers' exposure to mercury, efficient control of safety measures and assessment and communication of the risks from mercury. Despite vast progress in the reduction of exposure to mercury in the workplace, many categories of worker who are in contact with mercury in their professional activities are still at risk, including workers in ASGM and chloro-alkali plants, those involved in producing mercury-containing equipment and in waste management and dentists. The representatives of Member States in the Region stressed the important role of HBM in evaluating exposure to mercury, and outlined important prerequisites for effective HBM of occupational exposure such as updates of the lists of workplaces and occupations where people are exposed to mercury, development of criteria for biomonitoring and an update of threshold limit values (6).

However, HBM data on occupational and environmental exposure to mercury are lacking in many countries, especially in those with limited resources. Moreover, different approaches to study design and biomonitoring methods hinder the international comparability of the available data and prevent the global characterization of temporal patterns and spatial trends. At present, only a few countries have well-established national or regional (subnational) HBM programmes. The largest continuous national surveillance programme involving HBM is the National Health and Nutrition Examination Survey, which has been conducted by the Centres for Disease Control and Prevention and the National Center for Health Statistics of the United States of America since 1971 (23). A number of cohort and dietary studies underlying the assessment of population exposure in the Arctic are ongoing (24). The project DEMONstration of a study to COordinate and Perform Human biomonitoring (DEMOCOPHES) was an international HBM survey on a European scale that took into account cultural differences, ethics and the available resources and expertise in various European countries (25). At international level, the value of harmonized data collection has already been demonstrated in exposure surveys, such as the UNEP/WHO global survey of breast-milk contamination with persistent organic pollutants (26). Given that there is an urgent need for guidance on implementation of mercury HBM programmes, in particular in countries with limited human

and analytical resources, WHO is developing, in cooperation with UNEP, a global plan for mercury monitoring in relation to the Minamata Convention (27). Monitoring and assessment of prenatal exposure to mercury can be considered as an indicator of the effectiveness of the implementation of the Convention, although it is not the only way of monitoring exposure to mercury.

A standardized protocol template for mercury HBM surveys in maternity hospitals, involving mercury determination in maternal hair and other matrices, is under the development by the WHO Regional Office for Europe. It has been pilot-tested in seven Member States globally. The development and implementation of a harmonized approach to mercury HBM will enable the collection of comparable data throughout countries and regions and the monitoring of geographical and temporal trends of human exposure to mercury.

Various methods are used to assess occupational and environmental exposure and the burden of mercury in highly-exposed population groups, including biomarkers of different mercury species. For example, in the population living close to the Mediterranean Sea in Slovenia, the main predictor of mercury exposure was the consumption of fish; an HBM study revealed a large proportion of methylmercury in biological material. On the other hand, exposed populations living in contaminated sites exhibited higher mercury concentrations in biological samples but with a smaller proportion of mercury in the form of methylmercury (28). Workers contacting mercury due to their professional activities are mainly exposed to metalling and inorganic mercury vapours. This indicates the importance of speciation as well as the proper use of exposure biomarkers in HBM programmes depending on the source of mercury exposure.

The application of a harmonized approach to HBM surveys would facilitate the identification of highly exposed population groups and contaminated sites and enable an assessment of the impacts of policies aimed at reducing and preventing exposure to mercury and its health impacts. It would also help to improve estimates of the global burden of diseases caused by mercury and the resulting economic and social costs. A significant step to address these needs would be the implementation of a global plan for mercury monitoring by countries.



Human Biomonitoring Surveys would facilitate the identification of highly exposed population groups and contaminated sites and enable an assessment of the impacts of policies aimed at reducing and preventing exposure to mercury and its health impacts.



MINAMATA CONVENTION ON MERCURY

TEXT AND ANNEXES

Implementation of the Minamata Convention globally, is therefore, expected to result in significant benefits to public health as well as related economic and social benefits, and to contribute to the renewed sustainable development agenda.



UNITED NATIONS

Benefits of implementing the Minamata Convention and strengthening the role of the health sector in sound chemicals management

As already indicated, mercury and its compounds are toxic for humans and can cause severe developmental and health effects that affect the nervous, immune and digestive systems, lungs and kidneys, depending on the level and pathway of exposure and the form of mercury. This increases the burden of disease and health disorders and related costs to health systems and society. Implementation of the Minamata Convention globally, is therefore, expected to result in significant benefits to public health as well as related economic and social benefits, and to contribute to the renewed sustainable development agenda (29).

The size of the affected populations, and hence the opportunities for improvement, are substantial. For example, among selected subsistence fishing populations, between 1.5/1000 and 17/1000 children showed cognitive impairment (mild mental retardation) caused by the consumption of fish containing mercury (3). Within the European Union, more than 200,000 children born every year are exposed to methylmercury above the recommended by WHO safety limit of 2.5 µg/g (hair). (30)

The associated economic costs related to mercury exposure are substantial although not yet comprehensively estimated. In 2005, Trasande et al., using blood mercury data from the United States Centers for Disease Control and Prevention, estimated that the loss of productivity based on the predicted neurotoxicity of mercury from coal-burning power plants alone amounted to between US\$ 2.2 billion and US\$ 43.8 billion annually for the United States (3).

More than 15 million people (including three million women and children) in more than 70 countries are involved in ASGM where elemental mercury is used to extract gold. The risks to health of this activity can be considerable, and the subsequent burden of disease is most often borne by people in the weakest segments of society who live and work in informal mining camps with inadequate access to health services (3).

Multisectoral participation in the implementation of the Minamata Convention is crucial and will provide opportunities to strengthen institutional arrangements, not only for mercury but also for the sound management of chemicals in general. At the regional level, health and environment interministerial cooperation, such as the European Environment and Health Process, can provide a springboard for effective intersectoral action on chemicals (31). At international level, the establishment of the United Nations Environment Assembly as the main governing body of UNEP with universal membership provides a further opportunity to promote health in and through environment policies.

The implementation of the Minamata Convention in the health sector requires strong support from the national and international scientific community. Participants in the Regional Office's pilot survey identified the following areas for further scientific and technical support from WHO:

- the development of scientifically-based educational programmes for workers and the public;
- strengthening of networking and sharing of information on epidemiological studies and their results;
- the development of detailed scientifically-grounded guidance for exposure assessment;
- the development of strategies and policies.

Joint efforts by those in the health sector and in academia will benefit the collection of evidence on the health effects of hazardous chemicals, facilitate the implementation of advanced preventive measures and contribute to strengthening the human resources in the health sector itself. This will also be an important step in strengthening cooperation among the various stakeholders in chemical safety.



Joint efforts by those in the health sector and in academia will benefit the collection of evidence on the health effects of hazardous chemicals.

1

The Minamata Convention aims at protecting human health from the negative impacts of mercury

2

The health sector stands to play a critical role in implementation of the Minamata Convention both as a user of mercury-containing products and as the main player in public health protection

3

There is an urgent need to build adequate capacities in numerous areas of the management of mercury and of chemicals in general

4

Implementation of the Convention will contribute to the decrease of the burden of non-communicable diseases and health disorders caused by environmental and occupational exposure to mercury

Conclusions and highlights

The Minamata Convention aims at protecting human health from the negative impacts of mercury. Thus it is of direct relevance for the health sector, which stands to play a critical role in implementation of the Convention both as a user of mercury-containing products and as the main player in public health protection.

For the health sector to be able to play this crucial role, however, there is an urgent need to build adequate capacities in numerous areas of the management of mercury and of chemicals in general in close cooperation with stakeholders such as academic and research institutions, the relevant environment and labour protection authorities and nongovernmental organizations. Effective implementation of the Convention will contribute both to the decrease of the burden of noncommunicable diseases and health disorders caused by environmental and occupational exposure to mercury and to strengthening capacities in the health sector for dealing with hazardous chemicals of public health concern and emerging health issues related to chemicals.

References

1. Preventing disease through healthy environments. Exposure to mercury: a major public health concern. Geneva: World Health Organization; 2007 (<http://www.who.int/ipcs/features/mercury.pdf>, accessed 13 October 2016).
2. Poulin J, Gibb H. Mercury: assessing the environmental burden of disease at national and local levels [website]. Geneva: World Health Organization; 2008 (Environmental Burden of Disease Series No. 16; http://apps.who.int/iris/bitstream/10665/43875/1/9789241596572_eng.pdf, accessed 13 October 2016).
3. Mercury and health [online fact sheet]. Geneva: World Health Organization; 2013 (<http://www.who.int/mediacentre/factsheets/fs361/en/>, accessed 13 October 2016).
4. Minamata Convention on Mercury [website]. Geneva: United Nations Environment Programme; 2013 (<http://www.mercuryconvention.org/>, accessed 13 October 2016).
5. Resolution WHA67.11. Public health impacts of exposure to mercury and mercury compounds: the role of WHO and ministries of public health in the implementation of the Minamata Convention. In: Sixty-seventh World Health Assembly, Geneva, 19–24 May 2014. Resolutions and decisions, annexes. Geneva: World Health Organization; 2014:21 (document WHA67/2014/REC/1; http://apps.who.int/gb/ebwha/pdf_files/WHA67-REC1/A67_2014_REC1-en.pdf#page=1, accessed 13 October 2016).
6. Health Sector Involvement in the Implementation of the Minamata Convention: Mercury Exposure Assessment and Prevention (Bonn, Germany, 24–25 June 2015). Report of a meeting. Copenhagen: WHO Regional Office for Europe; 2015 (<http://www.euro.who.int/en/health-topics/environment-and-health/health-impact-assessment/publications/2016/health-sector-involvement-in-the-implementation-of-the-minamata-convention-2015>, accessed 3 February 2017).
7. Evaluation of certain food additives and contaminants. Sixty-seventh report of the Joint FAO/WHO Expert Committee on Food Additives. Geneva: World Health Organization; 2007:53–9 (WHO Technical Report Series 940; http://apps.who.int/iris/bitstream/10665/43592/1/WHO_TRS_940_eng.pdf, accessed 9 February 2017).

8. Evaluation of certain food additives and contaminants. Seventy-second report of the Joint FAO/WHO Expert Committee on Food Additives. Geneva: World Health Organization; 2007:55–64 (WHO Technical Report Series 959; http://apps.who.int/iris/bitstream/10665/44514/1/WHO_TRS_959_eng.pdf, accessed 9 February 2017).
9. Guidelines for drinking-water quality, fourth edition [website]. Geneva: World Health Organization; 2011 (http://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/, accessed 13 October 2016).
10. Air quality guidelines for Europe, second edition. Copenhagen: WHO Regional Office for Europe; 2000: 157–61 (WHO Regional Publication, European Series, No. 91; http://www.euro.who.int/__data/assets/pdf_file/0005/74732/E71922.pdf, accessed 13 October 2016).
11. Guidance for identifying populations at risk from mercury exposure. Geneva, United Nations Environment Programme and World Health Organization; 2008 (<http://www.who.int/foodsafety/publications/chem/mercuryexposure.pdf>, accessed 13 October 2016).
12. Developing national strategies for phasing out mercury-containing thermometers and sphygmomanometers in health care, including in the context of the Minamata Convention on Mercury. Key considerations and step-by-step guidance. Geneva: World Health Organization; 2015 (http://www.who.int/ipcs/assessment/public_health/WHOGuidanceReportonMercury2015.pdf?ua=1, accessed 13 October 2016).
13. Mercury in skin lightening products. WHO Information Sheet. Geneva: World Health Organization; 2011 (http://www.who.int/ipcs/assessment/public_health/mercury_flyer.pdf, accessed 13 October 2016).
14. Shimek JAM, Emmanuel J, Orris P, Chartier Y, editors. Replacement of mercury thermometers and sphygmomanometers in health care. Technical guidance. Geneva: World Health Organization; 2011 (http://whqlibdoc.who.int/publications/2011/9789241548182_eng.pdf, accessed 13 October 2016).

15. Health in All Policies: Framework for Country Action [website]. Geneva: World Health Organization; 2014 (<http://www.who.int/healthpromotion/frameworkforcountryaction/en/>, accessed 13 October 2016).
16. Health 2020: a European policy framework supporting action across government and society for health and well-being. Copenhagen: WHO Regional Office for Europe; 2013 (<http://www.euro.who.int/en/health-topics/health-policy/health-2020-the-european-policy-for-health-and-well-being/publications/2013/health-2020-a-european-policy-framework-supporting-action-across-government-and-society-for-health-and-well-being> , accessed 13 October 2016).
17. Promoting the phase down of dental amalgam in developing countries. Geneva: United Nations Environment Programme and World Health Organization; 2014 (http://www.unep.org/chemicalsandwaste/Portals/9/Mercury/Products/dental%20mercury%20phase%20down%20project%20brochure%20FINAL_lr.pdf , accessed 13 October 2016).
18. Basu N. 2015. Strengthening capacity in developing countries to implement the Minamata Convention – Ghana case example. In: 12th International Conference on Mercury as a Global Pollutant, June 14–19, 2015, Jeju, Korea. Abstract book; 2015:69 ([http://mercury2015.com/data/\[ICMGP2015\]%20Abstract.pdf](http://mercury2015.com/data/[ICMGP2015]%20Abstract.pdf), accessed 9 February 2017).
19. Suvd D, Rogers AM, Altanchimeg O, Bose-O’Relly S, Uyanga G, Baatatsol D et al. Mercury levels of environmentally exposed Mongolian residents in permanent artisanal small mining areas – Bornuur and Jargalant district. In: 12th International Conference on Mercury as a Global Pollutant, June 14–19, 2015, Jeju, Korea. Abstract book; 2015:67 ([http://mercury2015.com/data/\[ICMGP2015\]%20Abstract.pdf](http://mercury2015.com/data/[ICMGP2015]%20Abstract.pdf), accessed 9 February 2017).
20. Monitoring the implementation of Parma conference commitments: methodological and organizational issues. Report of a meeting, Bonn, Germany, 29–30 September, 2011. Copenhagen: WHO Regional Office for Europe; 2012 (http://www.euro.who.int/__data/assets/pdf_file/0004/164398/e96499.pdf?ua=1, accessed 13 October 2016).

21. Biomonitoring-based indicators of exposure to chemical pollutants. Report of a meeting, Catania, Italy, 19–20 April, 2012. Copenhagen: WHO Regional Office for Europe; 2012 (http://www.euro.who.int/__data/assets/pdf_file/0004/170734/e96640.pdf?ua=1, accessed 13 October 2016).
22. Report of the Second Extraordinary Meeting of the European Environment and Health Task Force (EHTF). The Hague, Netherlands, 31 May–1 June 2012. Copenhagen: World Health Organization; 2012 (http://www.euro.who.int/__data/assets/pdf_file/0006/186027/e96820.pdf?ua=1, accessed 13 October 2016).
23. National Health and Nutrition Examination Survey [website]. Atlanta: Centers for Disease Control and Prevention; 2017 (<https://www.cdc.gov/nchs/nhanes/index.htm>, accessed 4 April 2017).
24. AMAP assessment 2015: human health in the Arctic [website]. Oslo: Arctic Monitoring and Assessment Programme; 2015 (<http://www.amap.no/documents/doc/amap-assessment-2015-human-health-in-the-arctic/1346>, accessed 4 February 2017).
25. Human biomonitoring: facts and figures. Copenhagen: WHO Regional Office for Europe; 2015 (<http://www.euro.who.int/en/media-centre/events/events/2015/04/ehp-mid-term-review/publications/human-biomonitoring-facts-and-figures>, accessed 13 October 2016).
26. Human milk survey [website]. Geneva: Secretariat of the Stockholm Convention Clearing House; 2013 (<http://chm.pops.int/Implementation/GlobalMonitoringPlan/MonitoringActivities/Humanmilksurvey/tabid/270/Default.aspx>, accessed 9 February 2017).
27. Egorov A, Zastenskaya I, Jarosinska D, Martuzzi M. Towards developing a harmonized scheme for assessing human exposure to mercury on the global scale. In: 12th International Conference on Mercury as a Global Pollutant, June 14–19, 2015, Jeju, Korea. Abstract book; 2015:69 ([http://mercury2015.com/data/\[ICMGP2015\]%20Abstract.pdf](http://mercury2015.com/data/[ICMGP2015]%20Abstract.pdf), accessed 9 February 2017).

28. Horvat M, Tratnik JS, Mazej D, Jagodic M, Falnoga I, Pavlin M et al. Assessment of health risks for vulnerable population groups posed by exposure to mercury and its compounds. In: 12th International Conference on Mercury as a Global Pollutant, June 14–19, 2015, Jeju, Korea. Abstract book; 2015:69 ([http://mercury2015.com/data/\[ICMGP2015\]%20Abstract.pdf](http://mercury2015.com/data/[ICMGP2015]%20Abstract.pdf), accessed 9 February 2017).
29. Resolution 70/1. Transforming our world: the 2030 Agenda for Sustainable Development. In: Resolutions and Decisions adopted by the General Assembly during its seventieth session. Volume I. Resolutions. New York (NY): United Nations; 2016 (A/70/49 (Vol. I)); [http://www.un.org/en/ga/search/view_doc.asp?symbol=A/70/49\(Vol.I\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=A/70/49(Vol.I)), accessed 4 February 2017).
30. Improving environment and health in Europe: how far have we gotten? Copenhagen: WHO Regional Office for Europe; 2015: 77 (http://www.euro.who.int/__data/assets/pdf_file/0018/276102/Improving-environment-health-europe-en.pdf?ua=1, accessed 13 October 2016).
31. Fifth Ministerial Conference on Environment and Health [website]. Copenhagen: WHO Regional Office for Europe; 2016 (<http://www.euro.who.int/en/media-centre/events/events/2010/03/fifth-ministerial-conference-on-environment-and-health>, accessed 13 October 2016).

The WHO Regional Office for Europe

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