

MINAMATA INITIAL ASSESSMENT IN THE CARIBBEAN
(Antigua and Barbuda, Dominica, Grenada and Saint Vincent
and the Grenadines)

TERMS OF REFERENCE

**Design and Development of Animated Short Videos to Raise
Awareness on the Sources and Effects of Mercury Exposure to
Human Health and the Environment in the Caribbean**

SUPPORTING DOCUMENT

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MERCURY

Mercury (Hg) is a **naturally occurring element** in the Earth's crust and can be released to the environment by **natural sources** (such as volcanic eruptions or weathering of mercury-containing rock materials) or **anthropogenic sources** (such as mining, combustion of fuels, the intentional use of mercury in products and processes, and the re-mobilization of previous mercury releases). Anthropogenic sources can account for 30% of the mercury emissions in the atmosphere (AMAP/UNEP, 2013).

Mercury **cannot be destroyed** and once released from the crust and mobilized into the environment, it cycles between air, land and water. As a **highly toxic chemical element**, mercury is considered one of the **top ten chemicals of major public health concern** (WHO, 2017). Mercury is most **toxic** when in its organic state, **methylmercury**, which is formed in aquatic environments and can bio-accumulate up food chains. As such, mercury can enter the human body through inhalation, direct contact with the skin or ingestion of the methylated form through contaminated food or water.

The effects of mercury exposure on humans can vary. **Temporary effects**, such as headaches and

nausea, may occur due to short-term exposure, for example, if a person inhales mercury vapour from a broken mercury-added product like CFL bulbs.

Long-term or more dangerous effects include tremors, memory loss and many neurological and behavioral disorders. This is typically due to the accumulation of mercury in the body over a long period of exposure.

The largest known case of mercury poisoning (also known as Minamata disease) occurred in **Minamata Bay, Japan** in the 1950s. Mercury was present in the industrial wastewater that was being discharged for many years into the bay by a nearby chemical plant. The toxic chemical bioaccumulated in the fish, which was continuously eaten by the local population over decades, resulting in severe mercury poisoning cases.

It is important to note that the more severe health effects only arise after continuous exposure to mercury releases over time.



Mercury is used in some products and processes due to the useful properties it possesses. It has a high density, is liquid at room temperature and alloys to other metals. The biggest source of mercury releases globally is through its common use in **artisanal and small-scale gold mining** which is present in the Caribbean region in countries like Guyana and Suriname¹.



Mercury is also used in a range of manufactured and imported products in the Caribbean, such as

- mercury thermometers;
- compact fluorescent lightbulbs (CFLs);
- linear fluorescent lightbulbs (LFLs);
- some button-cell batteries;
- electrical switches and relays;
- silver dental amalgam fillings;
- certain blood pressure gauges; and
- some skin-lightening creams.



¹ Guyana and Suriname are both Parties to the Minamata Convention and are taking steps to phase-out mercury use in this sector.

Aside from the skin-lightening creams which provides for direct contact with the skin, these products are typically not harmful to health unless **broken or disposed of in an environmentally unsound manner**. When broken, mercury can be released into the environment.



MINAMATA CONVENTION ON MERCURY

In order to address the negative impacts posed by the anthropogenic releases of mercury, a **global treaty** called the Minamata Convention on Mercury was developed to protect human health and the environment. The text of the Minamata Convention was adopted on October 10, 2013 and the Convention **entered into force on August 16, 2017**. The Convention regulates, *inter alia*, mercury supply, sources and trade; mercury-added products and processes; interim

storage and disposal of mercury, its compounds and mercury waste; and the emissions and releases of mercury from human activities.

As of April 2019, there are 107 Parties to the Minamata Convention. **Eight (8)** of these are in the Caribbean region:

- Antigua and Barbuda
- Cuba
- Dominican Republic
- Guyana
- Jamaica
- Saint Kitts and Nevis
- Saint Lucia
- Suriname

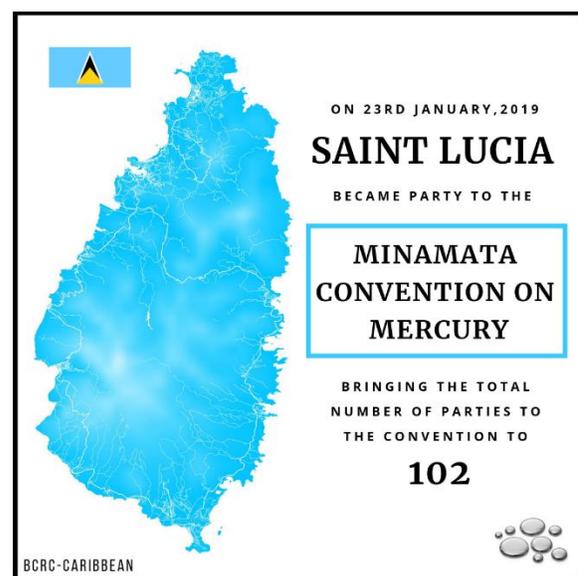


MINAMATA INITIAL ASSESSMENTS

Through Article 13 of the Minamata Convention, a financial mechanism is identified to support **developing countries** to ratify and implement the Convention. The Minamata Initial Assessment (MIA) project aims to determine

national situations of mercury releases to the environment and facilitate the national decision-making for the **ratification** (becoming Party) and **implementation** of the Minamata Convention in the participating countries. The MIA project in the Caribbean is funded by the **Global Environment Facility** with the **United Nations Environment Programme** acting as the implementing agency and the **BCRC-Caribbean** as the executing agency.

In the Caribbean, the first multi-country regional MIA project of its kind was completed in **November 2018** for **Jamaica, Saint Kitts and Nevis, Saint Lucia and Trinidad and Tobago**. Jamaica and Saint Kitts and Nevis were already Parties to the Minamata Convention during the execution of the project. Subsequent to the completion of the project, Saint Lucia submitted its instrument of ratification to become Party to the Minamata Convention on Mercury.



The second multi-country regional MIA project of its kind is currently ongoing, with an expected completion date of September 2019, for **Antigua and Barbuda, Dominica, Grenada and Saint Vincent and the Grenadines**. Of these countries, Antigua and Barbuda is a Party to the Minamata Convention while the others have indicated that they are actively considering becoming Party. The third single-country MIA project in the region is also currently being executed in **Belize** with an expected completion date of August 2020.

The development of an inventory of mercury releases in each participating country is a key project component, as it will inform participating countries of their national mercury situation and subsequently assist in applying action to increase their capacity in mercury management. Other components include an assessment of the national infrastructure and capacity for the management of mercury, including an assessment of the existing legislative framework and the identification of potentially contaminated sites, mercury storage and current disposal pathways.

Raising public awareness on the situation and issues associated with mercury releases is also a critical aspect of the MIA project.

POPULATION RISKS AND TARGETED GROUPS

Exposure to mercury can pose a higher risk to certain populations and targeted groups that are more sensitive to its effects. These groups include:

- Women of childbearing age
- Pregnant women
- Foetuses
- Newborns
- Young children (less than 12 years of age)

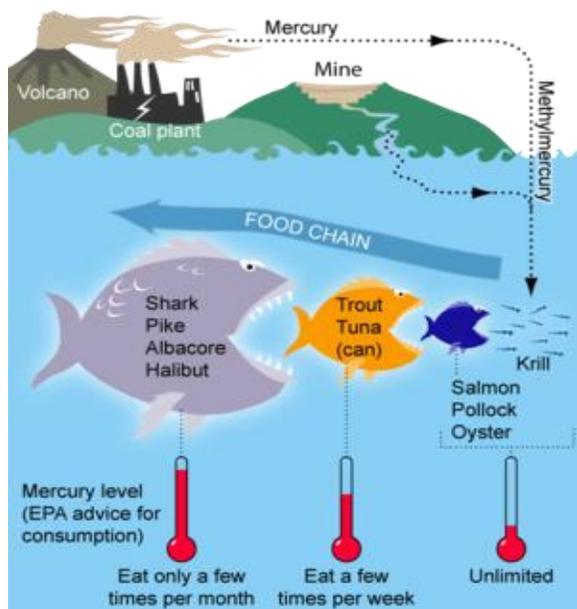
Pregnant women and women of childbearing age are considered to be **high risk groups** since their exposure to mercury can impact the foetus. The sensitivity of the developing system of foetuses, newborns and young children can enhance the dangerous impacts of the toxic effects of mercury. Similarly, individuals with preconditions, such as diseases of the liver, kidney, lung and nervous system may be at risk of being affected by mercury.

Certain groups are exposed to higher levels of mercury, either through a **regular diet of typically larger and more predatory fish** and aquatic organisms; **occupational** or environmental exposure; or through the consistent use of **mercury-added skin-lightening creams**.

MERCURY EXPOSURE THROUGH SEAFOOD

In the Caribbean, **fish is a staple food source and has numerous health benefits.** However, methylmercury, the organic form of mercury, can biomagnify and bioaccumulate in aquatic food webs, potentially contaminating an important food source for these populations.

Health based organisations such as the World Health Organisation (WHO), the United States Environmental Protection Agency (U.S. EPA) and the European Commission (EC) have examined fish mercury concentrations to identify the types of fish that are likely to have higher mercury content, and to **develop consumption guidelines** which indicate the number of seafood meals that could be eaten to stay within recommended doses.



The WHO and the EC general guidance level for fish mercury concentrations is 0.5 ppm, ww (parts per million, wet weight) with an “exemption” for larger predatory fish species of up to 1.0 ppm, ww which is similar to the U.S. EPA “no consumption” level.

Following these guidelines, fish with mercury levels between 0.05 and 0.22 ppm, ww have frequency recommendation of 1-2 meals per week. Many regularly and commercially harvested fish from the Caribbean Sea can be **safely consumed** either on a daily or weekly basis as they have an average mercury concentration under 0.22ppm, ww. Tilapia, lobster and other small individuals may be among these species. The consumption guidelines were developed based on a standard adult female consumer of a body weight of 132 pounds (60 kg) and a fish meal size of about 6 ounces (170 gm).

Mercury concentrations are highest in large, long-lived species, many of which are pelagic. King mackerel, shark and swordfish tested globally have average total mercury concentrations of over 0.9 ppm and are **riskier choices** for human consumption, where only one meal per month is recommended.

While these fish consumption concerns are important to note, there is also much consideration towards the benefits of fish consumption to human health and community livelihoods.

OCCUPATIONAL AND ENVIRONMENTAL EXPOSURE TO MERCURY

Populations involved in professions that expose them to mercury are at a higher risk due to the increased frequency of exposure. These **occupations** may include:

- Waste collectors, medical waste incinerator workers and landfill workers;
- Dental professionals including dental assistants;
- Medical professionals;
- Environmental /enforcement officers;
- Firemen and first responders to chemical accidents;
- Laboratory workers; and
- Other industrial workers.

People living in areas that are more susceptible to **environmental contamination** by mercury are also more likely to be affected by mercury exposure. These higher risk areas are typically around hot spots and point sources of uncontrolled mercury releases which **may** include major uncontrolled landfills, cement

production facilities, oil and gas refineries and waste incineration facilities. Point sources of mercury releases should implement controls to reduce emissions and releases to the environment and decrease the risk to nearby residents.

It is important to note that many of these target areas and communities depend on certain activities for their livelihood. As such, although raising awareness is vital, there is a level of sensitivity that should be taken into consideration when relaying the message.

GENDER CONSIDERATIONS

Gender equality is an integral part of the implementation of the Minamata Convention as it is important to represent equality of the experience and realities of all members of society.

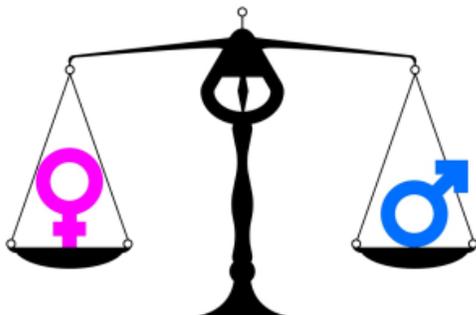
“Gender mainstreaming” has been defined by the United Nations Economic and Social Council as ‘a strategy for making women’s as well as men’s concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of the policies and programmes in all political, economic and

societal spheres so that women and men benefit equally and inequality is not perpetuated’.

The Sustainable Development Goal 5 focuses on Gender equality and **empowerment** of all **women and girls**.

From a chemicals and waste perspective, there are different biological factors that affect exposure and impacts in women compared to men. For example, women have time periods during which they are more **vulnerable** to the exposure to chemicals and consequently this exposure to various harmful chemicals can result in serious consequences for their babies. Chemicals transferred during fetal development can cause lifelong harm.

Due to some cultural norms, women are the number one users of cosmetics such as skin-lightening creams which may contain mercury and are therefore potentially more likely to be exposed.



WHAT CAN BE DONE?

Important measures should be put in place to educate the general public, as well as the above-mentioned target groups, on the hazards of mercury exposure and the **possible action to mitigate the risks**.

Residents in close proximity to mercury point-sources, such as industries that burn fossil fuels and facilities that handle waste disposal and incineration, should be informed of the potential added risk of mercury exposure. Similarly, workers at these facilities can be educated on the proper use of **personal protective equipment** to reduce exposure, and measures to reduce the release of mercury to the environment. Awareness of alternatives to **mercury-added products** available on the global market can be raised to encourage safer consumer choices for citizens. Some mercury-free alternatives include:

- LED lightbulbs;
- Digital/alcohol thermometers; and
- Composite dental fillings.

Encouraging users of skin-lightening creams to be aware of the potential risks and make a conscious effort to **read labels** on the cosmetics for the possible inclusion of mercury in the

ingredients before purchasing can promote the use of safer cosmetics and soaps.

Efforts should also be made to raise awareness on the **dietary choices** with regards to reducing the frequency of consumption of larger predatory fish species which may contain higher levels of mercury.

Additionally, **national action** to raise public awareness of mercury hazards should be undertaken in parallel with encouragement for public involvement in reducing environmental and health impacts of mercury contamination. Avenues to facilitate public responsibility should be put in place, such as **access to collection, recycling and disposal systems**, and **incentives** for using mercury-free alternatives. Guidelines for **separation of contaminated wastes** should be created and enforced by municipalities and private waste collectors.



SUPPLEMENTARY INFORMATION

Under the first MIA project in the Caribbean region (Jamaica, Saint Kitts and Nevis, Saint Lucia and Trinidad and Tobago), mercury awareness-raising videos and infographics were developed. These videos and infographics, as well as further mercury management information can be found at:

<http://www.bcrc-caribbean.org/minamata-convention-on-mercury/>

EXAMPLE OF PREVIOUS MERCURY AWARENESS RAISING INFOGRAPHICS DEVELOPED

mercury
in everyday products

Although **toxic**, mercury is used in a range of manufactured products

These products are typically not harmful to health unless they are broken or disposed of in an environmentally unsound manner

When they are broken, mercury emissions and releases can be released into the air, land and water

Routes of Exposure

- Direct skin contact
- Inhalation
- Dental amalgam exposure

By 2020, it is expected that the global manufacture, trade and use of certain mercury-added products will be phased out through the Minamata Convention on Mercury

However, there is need for safe disposal of mercury-containing wastes beyond 2020

Mercury-free alternatives are already widespread and available on the global market

For more guidance on this, visit the **Global Mercury Partnership Website** and www.bcrc-caribbean.org



The Basel Convention Regional Centre for the Caribbean (BCRC-Caribbean)

Developed under the project "Development of Minamata Initial Assessment for the Caribbean (Jamaica, Saint Kitts and Nevis, Saint Lucia, Trinidad and Tobago)"

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