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**Developing public health strategies  
for artisanal and small-scale gold  
mining within the Minamata  
Convention on Mercury:**

*findings and lessons learned from  
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Developing public health strategies for artisanal and small-scale mining within the Minamata Convention on Mercury: findings and lessons learned from country workshops

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# Contents

<b>Acknowledgements</b> .....	<b>iv</b>
<b>Background</b> .....	<b>v</b>
<b>Nigeria</b> .....	<b>1</b>
Background .....	1
Objectives .....	1
Outcomes of the workshop .....	1
Next steps decided by workshop participants .....	2
<b>Ghana</b> .....	<b>3</b>
Background .....	3
Objectives .....	3
Outcomes of the workshop .....	3
Next steps decided by workshop participants .....	4
<b>Mozambique</b> .....	<b>5</b>
Background .....	5
Objectives .....	5
Outcomes of the workshop .....	5
Next steps decided by workshop participants .....	6
<b>References</b> .....	<b>7</b>

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# Background

Mercury amalgamation remains the preferred method to extract gold employed in artisanal and small-scale gold mining (ASGM) worldwide. Liquid elemental mercury is added to an ore slurry to bind to gold and form a gold–mercury complex (amalgam). When gold is separated from mercury in the smelting process, high concentrations of mercury vapours are released. People working and living in ASGM communities are exposed to mercury mainly through inhalation of these toxic vapours. Furthermore, mercury dust is deposited on surfaces (walls, clothes, tools) and released to the environment, where microorganisms in water and soil convert elemental mercury into organic methylmercury, which accumulates in the food chain (1).

Acute mercury exposure affects the respiratory, cardiovascular and nervous systems, as well as the kidneys. Chronic exposure affects mostly the nervous system, causing neurological damage. Symptoms can take years to appear in adults. Pregnant women are particularly vulnerable, as prenatal exposure of the fetus to mercury can lead to irreversible neurological damage, including birth defects, developmental disorders and impaired cognition, and can result in adverse pregnancy outcomes such as stillbirth (2, 3).

The Minamata Convention on Mercury is an international treaty that entered into force in 2017 with the goal of protecting human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds (4). Article 7, paragraph 3(a) of the Convention states that each Party that has more than insignificant ASGM in its territory shall develop and implement a national action plan (NAP) in accordance with Annex C to the Convention, which further stipulates that such a NAP must include a public health strategy to prevent artisanal and small-scale miners and their

communities from being exposed to mercury. Developing the public health strategy is primarily the responsibility of ministries of health.

World Health Assembly resolution WHA67.11 (2014) calls upon the World Health Organization (WHO) Secretariat to support ministries of health in meeting their obligations under the Minamata Convention on Mercury (5). The WHO guidance document [Addressing health when developing national action plans on artisanal and small-scale gold mining under the Minamata Convention on Mercury](#) details an approach to addressing health during the wider process of developing the NAP (6).

To support ministries of health develop their detailed public health strategies for inclusion in the NAPs, WHO, in collaboration with the Swiss Tropical and Public Health Institute, developed a research approach. The approach was pilot-tested in three African countries – Ghana, Mozambique and Nigeria – that have extensive ASGM activities and were in the process of developing a NAP. The evidence collected and the recommendations that emerged by applying the research approach guided ministries of health and other stakeholders in developing the public health strategies. *A Step-by-step guide for developing a public health strategy for artisanal and small-scale gold mining in the context of the Minamata Convention on Mercury* to using the research approach is available for researchers or other types of assessors (7). Figure 1 shows the six steps to develop a public health strategy using the research approach. In the last step of the process, a national multistakeholder workshop is held to translate the findings and recommendations from the assessments (steps 3–5) into a public health strategy.

**Figure 1. Steps of the process to develop a public health strategy**



The goals of the national stakeholder workshops were to:

- present findings of the rapid health assessment and the institutional capacity assessment;
- present and discuss recommendations from both assessments;
- develop public health strategies for ASGM communities.

This advocacy brief describes the experiences of developing public health strategies for ASGM communities during national multistakeholder workshops in Ghana, Mozambique and Nigeria (8).<sup>1</sup> Once the public health strategies are finalized, they are incorporated into the NAP for implementation.

An example of a completed public health strategy for inclusion in the NAP, prepared by the Nigeria Federal Ministry of Health, is based on evidence collected using the research approach and the national multistakeholder workshop (9): [Public Health Strategy of the National Action Plan for Reduction/Elimination of Mercury Use in Artisanal and Small-Scale Gold Mining \(ASGM\) in Nigeria](#).

<sup>1</sup> Other ministry of health national workshop experiences related to the Minamata Convention on Mercury are described in *Strategic planning for implementation of the health-related articles of the Minamata Convention on Mercury: results from country workshops (8)*.

## Background

The Health Sector Workshop on Artisanal and Small-Scale Gold Mining: Public Health Strategic Priorities Development was held in Abuja, Nigeria, on 9–10 October 2019. Around 100 participants from a diverse range of stakeholders attended the workshop, including representatives of government ministries, international organizations, civil society organizations, miners' associations, women's mining associations and academic institutions.

The Nigeria Federal Ministry of Health, with guidance from WHO, led the participatory process of developing the public health strategy.

## Objectives

The objectives of the workshop were to:

- present the findings of the rapid health assessment and institutional capacity assessment;
- put forward recommendations based on the findings of the assessments;
- develop strategic public health priorities for the public health strategy.

## Outcomes of the workshop

The findings and recommendations from the rapid health assessment and the institutional capacity assessment were received with great interest by the participants and stimulated lively discussions. Among the issues raised, participants noted the following.

- Findings from the rapid health assessment may need to be limited to the four areas visited and not generalized to all ASGM sites, since there are many differing ASGM settings in Nigeria. These settings differ in terms of demographics, accessibility, organization of the mining site and security.
- Certain health issues or social and environmental determinants of health, for example drug abuse or illiteracy in ASGM populations, were not addressed in sufficient depth in the presentation of the rapid health assessment findings.

The recommendations were used to guide the selection of public health interventions in Nigeria's NAP.

Based on the findings and recommendations made, the priority areas identified for the public health strategy were:

1. increased awareness in the health sector and ASGM communities on the dangers of mercury and its compounds;
2. generation of evidence through data gathering and chemical surveillance to support implementation of health initiatives;
3. strengthening coordination in the health system to prevent, eliminate or manage mercury and heavy metals exposure;
4. building capacity for effective prevention of, detection of and response to mercury and heavy metal poisoning.

The four priority areas were distributed among the four groups. Participants self-divided into the groups and worked for 2.5 hours formulating the objectives, associated activities, responsibilities and monitoring indicators for their respective public health priorities, using a template developed by WHO (Table 1).

**Table 1. WHO template for developing a public health strategy for an ASGM national action plan**

Public health strategy							
Public health priorities	Activities	Target group, level of focus for activities	Who is involved	Responsibilities and tasks	Monitoring indicators	Budget	Time frame
1.	1.1						
	1.2						
	1.3						
2.	2.1						
	2.2						
3.	3.1						
Etc.							

The main discussion points around the draft public health strategy were as follows.

- A budget needs to be included for each proposed activity. Stakeholders considered, however, that first the public health strategy needed to be developed irrespective of the budget, but guided by the main question: What needs to be done? Implementation aspects, including budget and concrete timelines, should be addressed in the subsequent implementation planning phase.
- Mercury needs to be included in Nigeria's health legislation.
- Literacy levels of ASGM communities need to be considered in all aspects of the public health strategy.
- Awareness-raising should use popular means of communication, especially social media.

### Next steps decided by workshop participants

At the end of the workshop, all stakeholders agreed that the public health strategy would not be adopted the same day. The NAP committee would revise and consolidate the draft strategy following the workshop. The public health strategy was finalized some months later and endorsed by the Nigeria Federal Ministry of Health (9): [\*Public Health Strategy of the National Action Plan for Reduction/Elimination of Mercury Use in Artisanal and Small-Scale Gold Mining \(ASGM\) in Nigeria.\*](#)

### Workshop participants, Abuja, Nigeria, October 2019



James Sylvanus Ekeh, CERPMIST



## Background

The Health Sector Workshop on Artisanal and Small-Scale Gold Mining: Public Health Strategic Priorities Development was held in Aburi, Ghana, on 12–13 November 2019 with 31 participants. The workshop was co-organized by the Ghana Health Service and WHO Ghana. Participants included representatives from a range of Ministries (Health, Lands and Natural Resources, Sanitation and Water Resources, Trade and Industry), Ghana Environmental Protection Agency, Ghana National Association of Small Scale Miners, Minerals Commission, Food and Drugs Authority, Norwegian Institute of Public Health, Swiss Tropical and Public Health Institute, the Aurum Institute, Water Resources Commission, the World Bank and others. In an opening message, the Minister of Health emphasized that in the spirit of the 2030 Agenda for Sustainable Development, universal health coverage must reach all pockets of society, including ASGM communities. He requested the workshop stakeholders to develop a people-centred, implementable public health strategy.

## Objectives

The objectives of the workshop were to:

- present the findings of the rapid health assessment and the institutional capacity assessment;
- present and discuss recommendations based on the findings of the assessments;
- develop a draft public health strategy.

## Outcomes of the workshop

The findings and recommendations of the rapid health assessment and the institutional capacity assessment were well received by the workshop participants. The following main remarks were made.

- Participants emphasized the importance of recognizing differences between “artisanal miners” and “small-scale miners”, and noted that the assessments did not sufficiently distinguish between the two. The rapid health assessment focused predominantly on the health situation of artisanal miners. Small-scale miners are more likely to have a regulated work environment, access to mechanized equipment, and awareness of the use of chemicals, and may have access to personal protective equipment. As such, possible different health impacts of small-scale mining should not be overlooked when developing the ASGM public health strategy.

- Contributions by the small-scale mining industry to community development in terms of employment, taxes, or public infrastructure should be recognized.
- Socioeconomic and environmental issues were considered, as they often act as determinants of health.
- Efforts to formalize ASGM in Ghana should continue so that miners can benefit from regulations afforded to other types of workers, including small-scale miners.
- It is important to understand to what degree current policies or their implementation need to be addressed in order to increase the readiness of the health system to manage ASGM-related health issues.
- Because awareness of the health risks of mercury use already exists in certain mining populations, the focus should be on the facilitation of behavioural change.
- The impact of the public health strategy should be measured in the future, including exposure assessments in ASGM communities.
- The Ghana Health Service found that while the various ministries have good collaboration at the national level, policy implementation was not reaching ASGM communities sufficiently. Workshop participants committed to rectifying this gap.

Based on the findings and recommendations made, the priority areas identified for the public health strategy were:

1. direct impacts of mining
2. indirect impacts of mining
3. health system capacities
4. other institutional capacities.

In a plenary session, public health priorities were identified and agreed upon, based on findings and recommendations from the health and institutional assessments. The public health priorities were then distributed among four groups of five to six participants, assigned based on affiliation and background. Each group was tasked with identifying concrete activities, target groups, stakeholder involvement and responsibilities, monitoring indicators, a timeline, and a budget for their respective public health priorities, using the WHO template (see Table 1). In a four-hour working session, each group successfully developed a draft strategy to address the particular public health priorities assigned to them. Each group presented their work and, in a final plenary session, the work of all groups was discussed as a whole.

The national stakeholder workshop caught national media attention, with the Ghana Broadcasting Corporation featuring a three-minute clip in prime-time national news at 7 p.m. on 12 November 2019.

**Workshop participants, Aburi, Ghana, November 2019**



Gordon Niboyenyei Dakuu, WHO Ghana

**Next steps decided by workshop participants**

The NAP committee was tasked with incorporating the four proposed strategies into one final public health strategy, with endorsement by the stakeholders. The document would then be presented to the Ministry of Health for its endorsement.

Based on the outcomes of this workshop, Ghana would be in a comfortable position to deliver to the Minamata Convention Secretariat its NAP on ASGM, including the public health strategy, within a short time after the workshop.



# Mozambique

## Background

The Intersectoral Workshop on Artisanal and Small-Scale Gold Mining: Validating the Project for the Development of the National Action Plan on ASGM in Mozambique was held in Maputo, Mozambique, on 4 December 2019 with 24 participants. The workshop was convened by the Ministry of Land, Environment and Rural Development and organized by the Ministry of Mineral Resources and Energy. Key NAP institutional stakeholder participants included representatives of the Ministry of Health, Ministry of Land, Environment and Rural Development, Ministry of Mineral Resources and Energy, as well as representatives from WHO, the United Nations Industrial Development Organization, the Mozambican National Institute for Health, the Mozambican National Institute for Mines, the Ministry of Labour, the Customs Agency, and civil society organizations.

## Objectives

The national stakeholder workshop in Mozambique was somewhat different from the workshops in Nigeria and Ghana. The main goal in Mozambique was to share information about related work that had been undertaken by the relevant ministries. The specific objectives were to:

- provide a context for the workshop based on the Minamata Convention (presentation by the Ministry of Mineral Resources and Energy);
- provide an update on awareness-raising activities on the use of mercury in ASGM (presentation by the Ministry of Land, Environment and Rural Development);
- provide an update on the inventory of mercury in ASGM (presentation by the Ministry of Mineral Resources and Energy);
- present the findings of the rapid health assessment and the institutional capacity assessment (presentation by the Mozambican National Institute for Health, Swiss Tropical and Public Health Institute, and Public Health by Design);
- present lessons learned from the national stakeholder workshops in Nigeria and Ghana (presentation by WHO).

The workshop facilitated gathering key information and convening the stakeholders needed to further develop the NAP and to prepare the public health strategy component of the NAP.

## Outcomes of the workshop

During the workshop, priority areas to address in the public health strategy were identified based on the recommendations

## Workshop participants, Maputo, Mozambique, December 2019



Filipe Silva, Public Health by Design

put forward in the rapid health assessment and the institutional capacity assessment.

Following the Ghana example, the four priority areas identified for the public health strategy were:

1. direct impacts of mining
2. indirect impacts of mining
3. health system capacities
4. other institutional capacities.

### Next steps decided by workshop participants

The workshop participants identified the following actions as the next steps to be undertaken:

- Ministry of Health to convene a task force to complete the public health strategy based on the public health priorities that were identified;

consider using the WHO template (see Table 1) to organize objectives, associated activities, responsibilities, monitoring indicators, timeline, and budget for the public health priorities;

- finalize the NAP, including the public health strategy, and have it endorsed by the relevant national or regional authorities;
- convene a multisectoral and multistakeholder forum or workshop to validate the NAP and the public health strategy;
- ratify the Minamata Convention as soon as possible.



### Key messages and lessons learned from the three national workshops

- Feedback from participants in the three country workshops showed that the national multistakeholder workshop was a powerful approach to disseminate the research findings and recommendations that informed the development of the public health strategy. Stakeholders emphasized the direct benefits of the presentation of the findings and recommendations in helping them to develop the public health strategy and to envision how it could be implemented, as well as the value of group work as part of the process.
- Engagement of a broad range of stakeholders, including representatives of miners and their communities, is essential for developing a relevant, realistic and meaningful public health strategy. Public health experts typically lead such strategy development but often are not aware of many of the characteristics and realities of artisanal and small-scale gold miners and their communities, which need to be considered and included in the strategy.
- It is useful to create workshop working groups including representatives from various ministries, academic and research institutions, mining associations, and civil society associations to coordinate and focus on different public health priorities and activities for implementation under the public health strategy.
- Strategies and policies need to be grounded in reality in order to be relevant and to keep people engaged.
- Informing stakeholders of a timeline to complete their work can help in getting people to work together and remain motivated.
- A visual representation is recommended to ensure all stakeholders fully understand the rationale and justification for the development of the public health strategy part of the NAP.
- Countries chose different ways to organize their public health priorities based on evidence and recommendations from the assessments.
- Working groups found the WHO template helpful for capturing and organizing the essential elements of the public health strategy.

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# References

1. Strategic planning for implementation of the health-related articles of the Minamata Convention on Mercury. Geneva: World Health Organization; 2019 (<https://apps.who.int/iris/handle/10665/329449>, accessed 29 January 2021).
2. Nyanza EC, Dewey D, Manyama M, Martin JW, Hatfield J, Bernier FP. Maternal exposure to arsenic and mercury and associated risk of adverse birth outcomes in small-scale gold mining communities in northern Tanzania. *Environment International*. 2020;137:105450. doi:10.1016/j.envint.2019.105450.
3. Environmental and occupational health hazards associated with artisanal and small-scale gold mining. Geneva: World Health Organization; 2016 (<https://apps.who.int/iris/handle/10665/247195>, accessed 29 January 2021).
4. Minamata Convention on Mercury. Nairobi: United Nations Environment Programme (<http://www.mercuryconvention.org/>, accessed 29 January 2021).
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. Geneva: World Health Organization; 2014 (<https://apps.who.int/iris/handle/10665/162849>, accessed 29 January 2021).
6. Addressing health when developing national action plans on artisanal and small-scale gold mining under the Minamata Convention on Mercury. Geneva: World Health Organization; 2019 (<https://apps.who.int/iris/handle/10665/329916>, accessed 29 January 2021).
7. A step-by-step guide for developing a public health strategy for artisanal and small-scale gold mining in the context of the Minamata Convention on Mercury. Geneva: World Health Organization; 2021.
8. Strategic planning for implementation of the health-related articles of the Minamata Convention on Mercury: results from country workshops. Geneva: World Health Organization; 2019 (<https://apps.who.int/iris/handle/10665/330146>, accessed 29 January 2021).
9. Public Health Strategy of the National Action Plan for Reduction/Elimination of Mercury Use in Artisanal and Small-Scale Gold Mining (ASGM) in Nigeria. Abuja: Nigeria Federal Ministry of Health with support from the World Health Organization; 2020 (<https://www.afro.who.int/publications/public-health-strategyof-national-action-plan-reductionelimination-mercury-use>, accessed 10 February 2021).

