



## **GEF ID 19036: GEF7 PHASING DOWN DENTAL AMALGAM PROJECT**

### **GLOBAL PROJECT KICK-OFF MEETING MEETING REPORT**

#### **CONTENT**

1. Background.....	3
2. Meeting objectives .....	3
3. Welcome and opening remarks.....	3
4. Accelerating implementation of dental amalgam provisions of the Minamata Convention on Mercury.....	4
5. Project overview – Technical.....	5
6. Project overview – Implementation arrangements.....	7
7. Project component 1 session.....	9
7.1. Project component 1 scope: outcomes, targets, deliverables.....	9
7.2. National context, challenges and opportunities to improve policies and technical capacity in order to phase down dental amalgam use in Senegal .....	10
7.3. An innovative approach to model dental restorative materials global consumption – preliminary results .....	12
7.4. Thailand context: challenges and opportunities to improve policies and technical capacity to phase down dental amalgam use.....	14
7.5. Overview of dental caries management: dental amalgam versus quality mercury-free dental materials .....	16
7.6. Uruguay context: challenges and opportunities to improve policies and technical capacity to phase down dental amalgam use.....	18
7.7. Innovative workforce models and training to accelerate phasing down the use of dental amalgam .....	19
7.8. Group discussion and Q&A.....	21
8. Project component 2 session.....	22
8.1. Project component 2 scope: outcomes, targets, deliverables.....	22
8.2. National context, challenges and opportunities to improve management of mercury and hazardous waste from dental use in Senegal .....	23
8.3. Policy guidance and lessons learned from phasing out of mercury thermometers and sphygmomanometers in healthcare.....	25

8.4. National context, challenges and opportunities to improve management of mercury and hazardous waste from dental use in Thailand.....	26
8.5. Mercury waste management.....	28
8.6. National context, challenges and opportunities to improve management of mercury and hazardous waste from dental use in Uruguay.....	31
8.7. Group discussion and Q&A.....	32
9. Project component 3 session.....	32
9.1. Project component 3 scope: outcomes, targets, deliverables.....	32
9.2. Knowledge hub for dissemination and exchange of information and expertise.....	34
9.3. Mainstreaming gender into project activities: Project gender action plan.....	34
9.4. Group discussion and Q&A.....	35
10. Closure of the meeting.....	36

## 1. Background

The Minamata Convention on Mercury is a global treaty that aims to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The treaty addresses mercury-added products, including dental amalgam, a direct restorative material alloy that contains approximately 50% elemental mercury by weight. Annex A Part II of the Convention outlines the provisions to phase down the use of dental amalgam.

The Global Environment Facility (GEF) funded project ‘Accelerate implementation of dental amalgam provisions and strengthen country capacities in the environmental sound management of associated wastes under the Minamata Convention’ (GEF 7 Phasing Down Dental Amalgam Project) is implemented by the United Nations Environment Programme (UNEP) and executed by the World Health Organization (WHO) with targeted technical input from the UNEP Global Mercury Partnership.

The Global Project Kick-off meeting was held on 28 of April 2023 at WHO headquarters in Geneva, Switzerland, to formally launch the GEF7 Phasing Down Dental Amalgam project.

## 2. Meeting objectives

The specific objectives of the meeting were to:

- present the project objectives, scope, timeline and deliverables to all project stakeholders and address any questions;
- understand the national context, challenges and opportunities, of countries participating in the project;
- establish a set understanding of the roles and collaboration between the project team and stakeholders at national and global levels; and,
- ensure everyone is on the same page and ready to implement project activities.

## 3. Welcome and opening remarks

Mr Anil Sookdeo, Coordinator and Senior Environmental Specialist of the Chemicals and Waste Focal Area at the GEF, provided the opening remarks for the meeting on behalf of the funding agency and highlighted the importance of this project by sharing that estimates suggest 30-40 per cent of mercury in dental amalgam enters solid waste streams, accumulating in water, soil and the atmosphere. Mr Sookdeo stated that the project is working with chief dental officers at Ministry of Health to develop long-term solutions that consider national circumstances and context, and will make a great example of working locally and scaling globally.

Mr Ludovic Bernaudat, Officer in Charge of the GEF Chemicals and Waste Unit at UNEP, also welcomed participants on behalf of the project implementing agency, thanked the close collaboration with the three countries, and emphasized that ideally, through the project, additional countries could also be guided to transition away from the use of dental amalgam. Mr Bernaudat added that having the three countries in different regions and at different stages in the process of phasing down the use of dental amalgam were strengths in the project design to support other countries facing similar situations in accelerating the implementation of the Minamata Convention on Mercury.

Dr Bente Mikkelsen, Director of the Noncommunicable Diseases Department at WHO, the executing agency of the project, extended a warm welcome to participants and congratulated them for taking part in a project that clearly highlights the link between health and environment. Dr Mikkelsen also noted that dental caries was the most common noncommunicable disease worldwide, with a disease burden of approximately 2.5 billion people of all ages. She added that the project represented a great opportunity to support countries and oral health professionals with the guidance and tools they need to

accelerate phasing down the use of dental amalgam to protect human health and the environment from the harmful effects of mercury pollution.

#### 4. Accelerating implementation of dental amalgam provisions of the Minamata Convention on Mercury

**Presenter:** Eisaku Toda, Senior Programme Management Officer, Minamata Convention Secretariat

The Minamata Convention on Mercury has the objective to protect the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. It addresses the whole life cycle of mercury from supply and trade to use, emissions, releases and disposal. Human health is the heart of the objective of the Minamata Convention. Article 16 ‘Health aspects’ states that the Conference of the Parties (COP), in considering health-related issues or activities should consult, collaborate, promote cooperation and exchange of information with the World Health Organization.

Article 4 of the Minamata Convention addresses mercury-added products. Annex A Part II originally had a list of 9 measures to phase down the use of dental amalgam and parties to the Convention were encouraged to implement more than two measures from the list. During COP4 in 2022, two mandatory measures were added to exclude the use of bulk mercury and exclude its use for the dental treatment of deciduous teeth, patients under 15 years old, pregnant and breastfeeding women (see figure 1). The latter measures will enter into force on 28 September 2023.

<i>Mercury-added products</i>	<i>Provisions</i>
Dental amalgam	<p>Measures to be taken by a Party to phase down the use of dental amalgam shall take into account the Party’s domestic circumstances and relevant international guidance and shall include two or more of the measures from the following list:</p> <ul style="list-style-type: none"> <li>(i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration;</li> <li>(ii) Setting national objectives aiming at minimizing its use;</li> <li>(iii) Promoting the use of cost-effective and clinically effective mercury-free alternatives for dental restoration;</li> <li>(iv) Promoting research and development of quality mercury-free materials for dental restoration;</li> <li>(v) Encouraging representative professional organizations and dental schools to educate and train dental professionals and students on the use of mercury-free dental restoration alternatives and on promoting best management practices;</li> <li>(vi) Discouraging insurance policies and programmes that favour dental amalgam use over mercury-free dental restoration;</li> <li>(vii) Encouraging insurance policies and programmes that favour the use of quality alternatives to dental amalgam for dental restoration;</li> <li>(viii) Restricting the use of dental amalgam to its encapsulated form;</li> <li>(ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land.</li> </ul> <p>In addition, Parties shall:</p> <ul style="list-style-type: none"> <li>(i) Exclude or not allow, by taking measures as appropriate, the use of mercury in bulk form by dental practitioners;</li> <li>(ii) Exclude or not allow, by taking measures as appropriate, or recommend against the use of dental amalgam for the dental treatment of deciduous teeth, of patients under 15 years and of pregnant and breastfeeding women, except when considered necessary by the dental practitioner based on the needs of the patient.</li> </ul>

Figure 1. Annex A Part II of the Minamata Convention on Mercury as amended by COP 4

In 2021, parties reported to the Minamata Convention regarding the implementation of the Convention, including the original nine measures to phase down the use of dental amalgam. Twenty-

eight out of 113 parties reported that they had not implemented the obligations to phase down the use of dental amalgam (two or more measures of the original nine). Of the 86 parties that responded “Yes”, 29 only reported one measure. The reported measures have been mapped according to the nine original measures and beyond (see Figure 2). Further analysis will be presented at the upcoming COP5.

Measure listed in part II of annex A	Number of Parties reporting to have taken measures
(i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration	25
(ii) Setting national objectives aiming at minimizing use of dental amalgam	13
(iii) Promoting the use of cost-effective and clinically effective mercury-free alternatives for dental restoration	18
(iv) Promoting research and development of quality mercury-free materials for dental restoration	5
(v) Encouraging representative professional organizations and dental schools to educate and train dental professionals and students on the use of mercury-free dental restoration alternatives and on promoting best management practices	24
(vi) Discouraging insurance policies and programmes that favour dental amalgam use over mercury-free dental restoration	8
(vii) Encouraging insurance policies and programmes that favour the use of quality alternatives to dental amalgam for dental restoration	5
(viii) Restricting the use of dental amalgam to its encapsulated form	27
(ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land	37
<b>Other measures reported by parties include the following:</b> <ul style="list-style-type: none"> <li>• Banning the use of dental amalgam for persons under 15 years of age, pregnant and breastfeeding women (14 parties).</li> <li>• Restricting the construction, renovation, and expansion of dental amalgam material production devices (1 party).</li> <li>• Banning the use of dental amalgam (5 parties).</li> <li>• Setting a national deadline for phasing out the use of dental amalgam (7 parties).</li> <li>• Phasing out dental amalgam in the public sector (8 parties)</li> </ul>	

Figure 2. Measures reported by parties in national reporting to the Minamata Convention

Due to the challenges raised by parties to phase out and phase down mercury-added products, a global three-day workshop is being organized on 21-23 June 2023 to support the implementation of the Minamata Convention obligations on mercury-added products.

Participants were informed that a proposal to amend Part I and Part II of Annex A related to dental amalgam was submitted by Botswana and Burkina Faso, on behalf of the Africa region, for consideration at COP5.

## 5. Project overview – Technical

**Presenter:** Benoit Varenne, Dental Officer, Oral Health Programme, NCD Department, WHO

Mercury is in the top 10 chemicals of major public health concern according to the World Health Organization (see figure 3). Dental amalgam is a dental filling material used to fill cavities caused by dental caries and it has been used for more than 175 years. Dental amalgam is a mixture of metals, consisting of elemental mercury (~50%) and a powdered alloy commonly composed of silver, tin, and copper.

There are two World Health Assembly (WHA) resolutions that give a specific mandate to WHO to support the implementation of the Minamata Convention on Mercury:

- resolution WHA67.11 on 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;<sup>1</sup> and
- resolution WHA74.5 on Oral Health.<sup>2</sup>

<sup>1</sup> World Health Assembly, 67. (2014). Resolution WHA67.11: <https://www.who.int/publications/i/item/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>

<sup>2</sup> World Health Assembly, 74. (2021). Resolution WHA74.5: [https://apps.who.int/gb/ebwha/pdf\\_files/WHA74/A74\\_R5-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_R5-en.pdf)

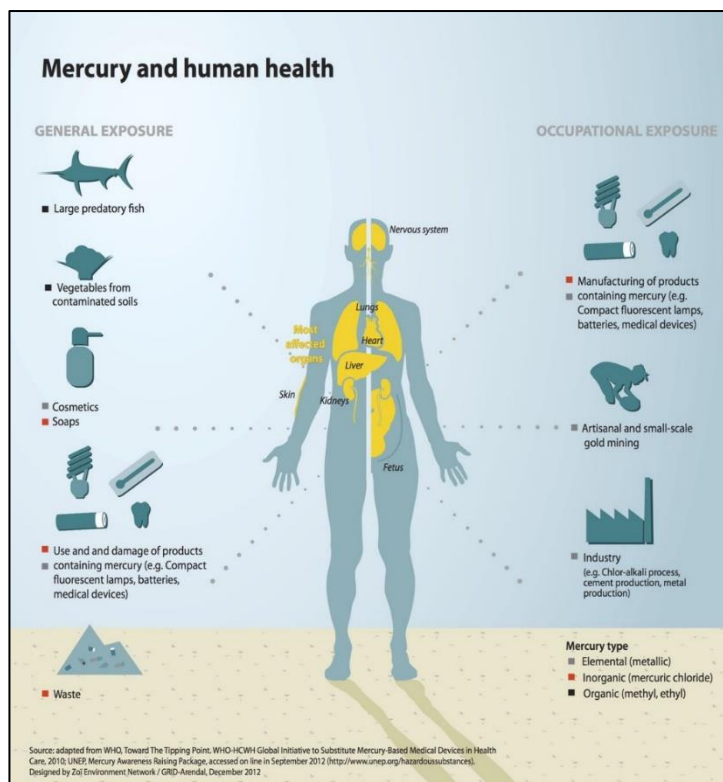


Figure 3. Mercury and human health

The 3-year GEF Phasing Down Dental Amalgam project officially started on 1 March 2023 and has the aim to protect human health and the environment from harmful effects of mercury through implementation of policies and improved practices to phase down the use of dental amalgams.

The project will support the implementation of the Minamata Convention on Mercury in both global and national contexts, with several activities to be implemented in three countries: Senegal, Thailand and Uruguay. There are three main project components containing a number of outputs and main activities (see figure 4):

1. phase down of dental amalgam use through improved policies and technical capacity;
2. improve management of mercury and hazardous waste from dental use; and
3. knowledge management and global awareness.

The project's overall targets are:

- reduction and avoidance of approximately 11.6 tons of mercury (approximately 0.3 tons of mercury to be reduced and 11.3 tons to be avoided);
- three sets of national policies developed and implemented to minimize the use of dental amalgam in line with related provisions of the Minamata Convention;
- one global guidance developed on how to effectively manage dental amalgam and associated wastes;
- expected total beneficiaries from the project in three target countries include 14,750,043 men and 14,750,043 women; and,
- at least 3 additional countries demonstrate implementation of Annex A Part II of the Minamata Convention through project dissemination.

Multisectoral collaboration is crucial for the project - working across UN agencies (WHO and UNEP) and across governments (Ministry of Health and Ministry of Environment). Moreover, it is important to identify all key stakeholders, at global and national levels, during the project implementation phase. Project stakeholders include GEF, WHO, UNEP, governments from the three countries, UNEP Global Mercury Partnership, Minamata Convention on Mercury Secretariat, Secretariats of the Basel,

Rotterdam and Stockholm conventions, civil society organizations/Nongovernmental organizations, academia, private sector, health workforce, and the community.

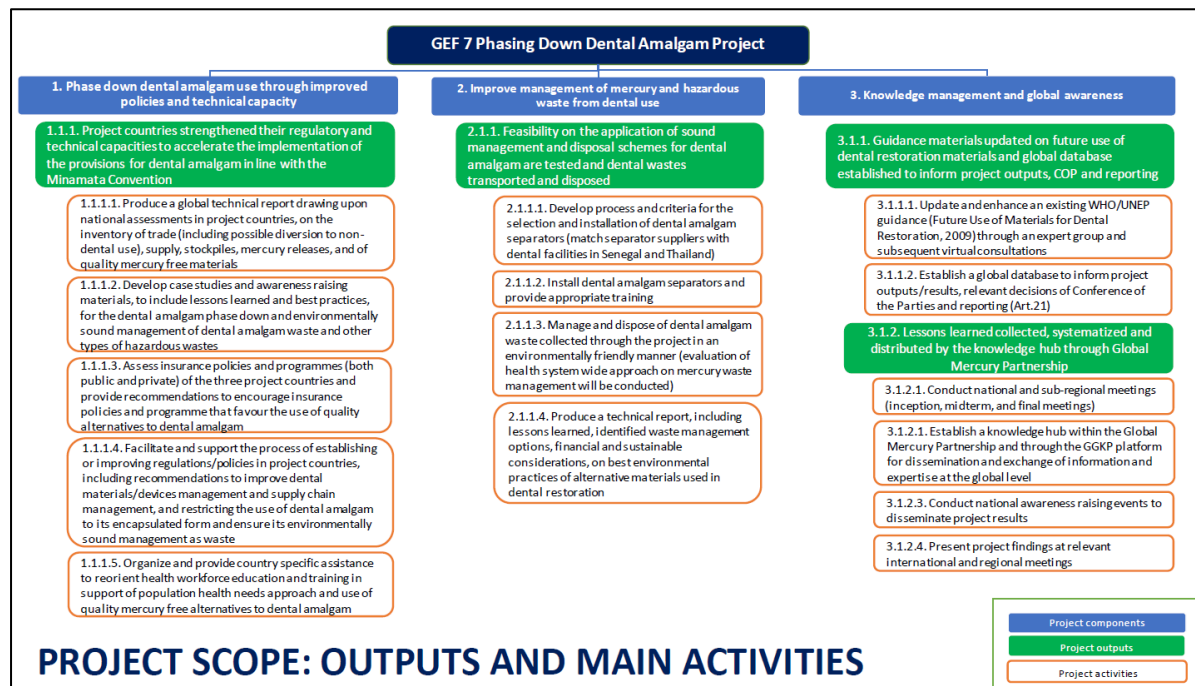


Figure 4. Project components, outputs and main activities

## 6. Project overview – Implementation arrangements

**Presenter:** Grace Halla, Task manager, GEF Chemicals and Waste Unit, UNEP

UNEP has collaborated with the GEF on over 1000 projects in more than 160 countries. In UNEP's current GEF portfolio, there are a total of 363 projects amounting to \$1.25 billion. As part of the mercury portfolio, there are 3 projects on mercury-added products, all executed or co-executed by the World Health Organization.

UNEP as the project's implementing agency (IA) is responsible for:

- contracting of executing agencies (i.e. WHO) and targeted technical assistance (i.e. UNEP Global Mercury Partnership);
- supervising the project on compliance with project framework strategies, revision of project reports and undertaking supervision missions;
- providing technical and administrative guidance, and quality assurance;
- organizing the terminal evaluation; and
- coordinating and consulting with relevant key stakeholders (e.g. GEF Secretariat, Minamata Convention Secretariat & GEF operational focal points).

WHO is working as one executing agency (EA) through three levels (Headquarters - Region - Country) and the level of responsibility assigned to WHO Headquarters/country offices/regional offices will vary according to the project component and activities, but also according to the national context. WHO as the EA of the project is responsible for:

- execution on a day-to-day basis, including overall project management and human resources;
- agreements with project countries

- acting as the secretary of Global Project Steering Committee (Global PSC) and support National Project Steering Committees (National PSCs);
- reports to IA and Global PSC on the achievement of outputs and activities; and
- reports to IA on a quarterly basis (expenditure and consolidated progress report) and annual (annual workplan, procurement plan, forecast and project implementation review).

UNEP Global Mercury Partnership (targeted technical assistance to WHO) is involved in all project components and is responsible for:

- support and document the environment sound management of dental waste in each project country;
- knowledge generation, curation and dissemination;
- global communication, advocacy, and campaigns; and
- data and trend analysis.

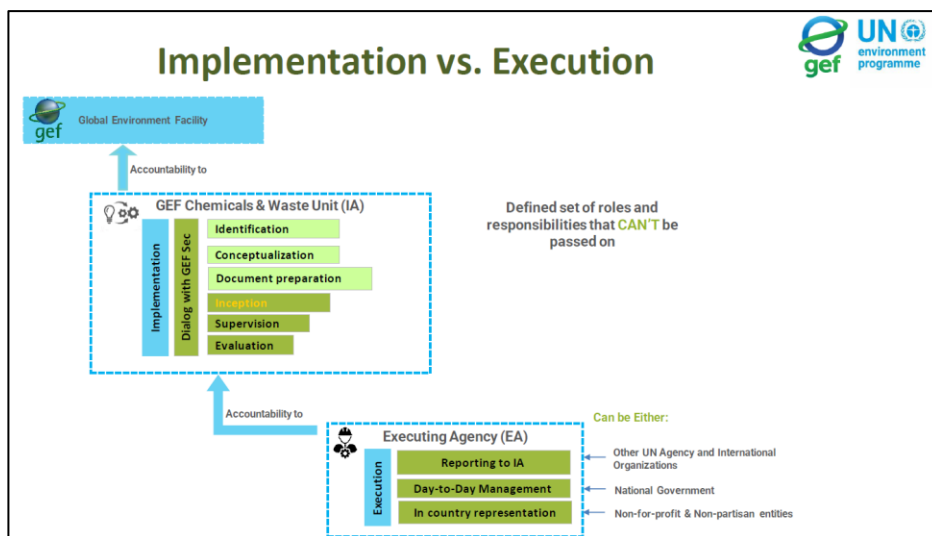


Figure 5. Project implementation versus execution

The implementation arrangement was updated (changes highlighted in yellow) to include the role of the UNEP Global Mercury Partnership and the WHO Regional Offices as shown in figure 6.

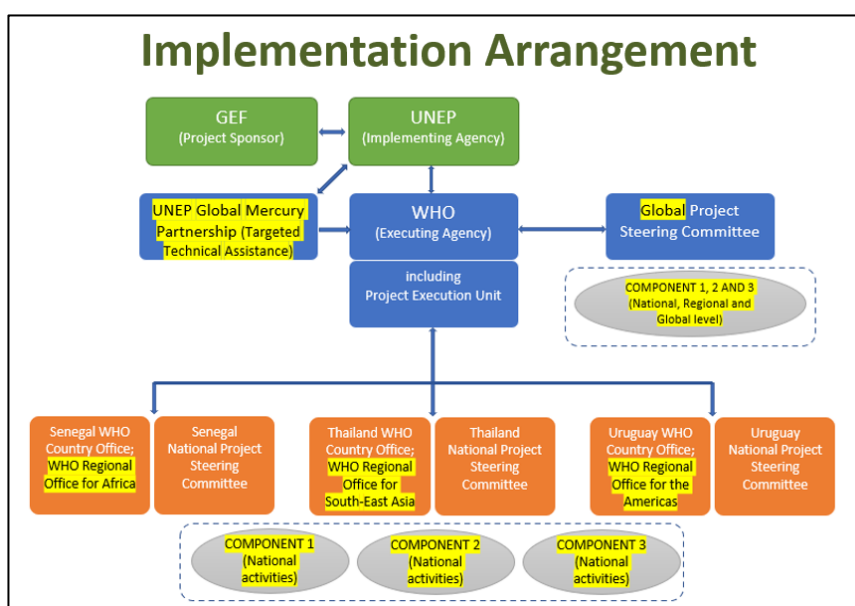


Figure 6. Project implementation arrangement (updated)



The Global PSC was established at project inception. It is composed of WHO (Secretary), UNEP (1), and National Focal Points (Ministry of Environment and Ministry of Health – 1 per Ministry). It will meet annually to:

- review and approve work plans and budgets;
- provide overall supervision implementation;
- take corrective actions; and
- enhance coordination and synergies of related activities at global and regional levels.

National PSCs will need to be established in alignment with national priorities, stakeholders and activities. It will be composed of 1 representative from different national entities (e.g., Ministry of Environment, Ministry of Health, civil society organizations, academia, and private sector). The Ministry of Environment and Ministry of Health will act as Co-Chairs, and the WHO Regional and National Offices will provide day-to-day management and act as secretary. The National PSC will meet every 6 months or as needed. The Terms of Reference need to be developed by WHO in the second half of 2023.

Co-financing partners of the project provide financing that is additional to the GEF funds and supports the implementation of GEF financed projects and achievement of its objectives; however, no financial transaction is expected between the project and co-financing partners. Their role includes undertaking parallel and ongoing initiatives that contribute to effectiveness, impacts and sustainability, particularly by enabling the GEF to achieve longer-lasting and larger-scale global environmental benefits (synergies, co-benefits and complementarity). Co-financing partners are responsible for:

- support and participate in country-level activities through consultations with WHO, Global Mercury Partnership and national counterparts (no decision-making role in project activities); and
- assess and provide co-financing figures on an annual basis (July) to WHO and/or Global Mercury Partnership.

**Discussion and Q&A session:**

- GEF funds can be utilized towards project personnel, but not towards government staff salaries. To an extent, GEF funds can also be used toward office space, internet and utilities that are planned to be spent in target countries (excluding WHO office expenses at all levels which should be part of WHO's co-financing toward the project).

## **7. Project component 1 session**

### **7.1. Project component 1 scope: outcomes, targets, deliverables**

**Presenter:** Gabriela Sardon, Consultant, Oral Health Programme, NCD Department, WHO

The first component of the project is titled 'Phase down of dental amalgam use through improved policies and technical capacity'. It focusses on technical guidance and regulatory strengthening in the three target countries through multi-sectoral collaboration and in line with the Minamata Convention on Mercury.

The project will integrate all 11 measures listed in the amended Annex A Part II of the Minamata Convention (see Figure 1), where relevant, into project component 1 activities. This includes the original nine measures and the additional two mandatory measures adopted at COP4 of the Minamata Convention.

The specific targets that project component 1 seeks to achieve are:

- 3 sets of national policies developed and implemented (one per country) to minimize the use of dental amalgam in line with related provisions of the Minamata Convention;
- 10% increase in dental facilities in each target country switching to mercury-free alternatives;
- 10% increase in population in each target country with dental health insurance which; and excludes the application of dental amalgam (50% men and 50% women).

There are five main activities included in project component 1, each with concrete deliverables (see Figure 7). The project's main activities can be adapted according to the national context of each target country as each of them are at a different stage in phasing down de use of dental amalgam.

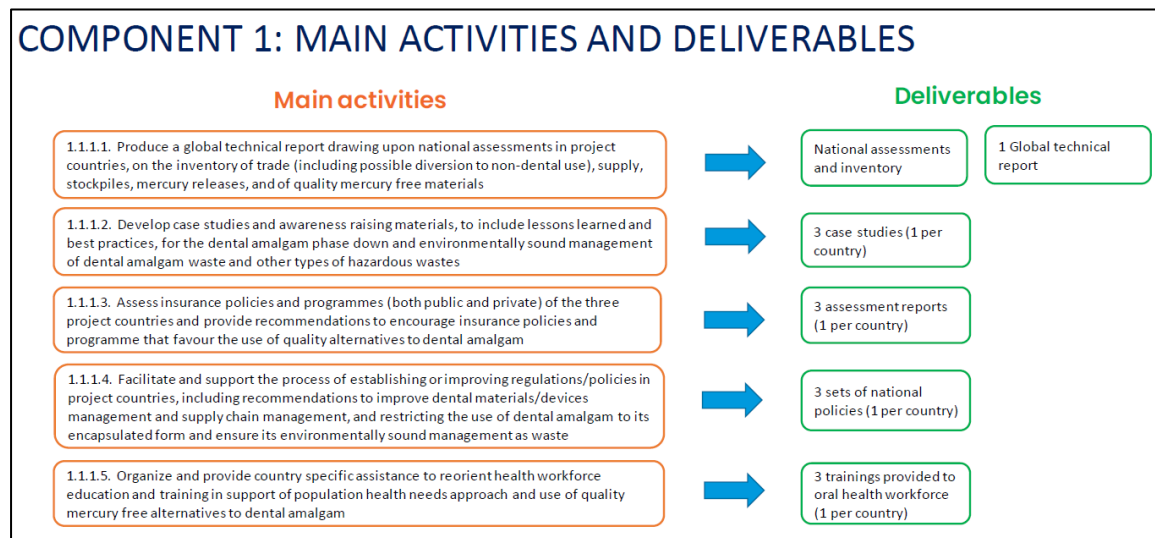


Figure 7. Main activities and deliverables of project component 1

## 7.2. National context, challenges and opportunities to improve policies and technical capacity in order to phase down dental amalgam use in Senegal

**Presenter:** Codou Badiane Mané, Chief Dental Officer, Ministry of Health, Senegal

Senegal is a country in West Africa located in the Atlantic Ocean coastline, divided into 14 administrative regions, with a population of 18.2 million people of which 47% live under the poverty line.

The health system of Senegal is organized in a pyramid structure of 3 levels (see figure 8). In the public sector, there are 14 medical regions, 40 hospitals, 79 health districts, 107 health centres, and 163 institutions offering dental services. In the private sector, there are 102 hospitals and clinics, 570 paramedical practices, and 321 dental practices.

A few considerations regarding the oral health system in Senegal:

- Dental services are found in health centres and public hospitals with a coverage of 90%.
- Private clinics represent 63% of all dental care services.
- In 2022, there were approximately 552 officially active dentists in Senegal of which 58% (321) worked in the private sector.
- There are semi-public not-for-profit denominational dental centres, such as at the municipal centres and army garrison.
- 60.3% of all dentists work in the Dakar region.
- Senegal has a National Oral Health Strategic Plan 2022-2026.



Figure 8. Senegal health system structure

#### Supply and demand of oral health services:

- Dental caries affects 76.3% of the adult population (based on a WHO STEPS survey conducted in 2015) and, according to some university studies, this prevalence is higher in school-aged children.
- 62.5% of the population do not use dental care services for various reasons (e.g. financial, geographical). Out-of-pocket expenses can be major barriers to accessing oral health care.
- There is uneven distribution of dental facilities and professionals across the country.
- Senegal's universal health coverage (CMU) rate, including the oral care package, has increased from 20% in 2013 to 53% in 2022.
- Amalgam restorations are covered by insurance, but there are inadequate dental caries prevention strategies.

#### Dental amalgam utilization in Senegal (as per the results of the Minamata Initial Assessment):

- Information and data on mercury amalgam fillings are almost non-existent in Senegal.
- Dental amalgam remains the material of choice for dental restorations in the public sector and it is widely taught in dental schools. Although some oral health professionals are increasingly using alternative materials to dental amalgam, these are considered expensive by patients.
- Senegal does not have, to date, a legal and regulatory system specific to the field of dental amalgams. No law is currently in force to control the use of mercury in dental amalgam fillings.
- In dental practices, there is practically no disposal mechanism and environmentally sound management of waste containing mercury.

Senegal has made national progress to phase down the use of dental amalgam on the following measures:

Measures listed in Annex A Part II of the Convention	Progress accomplished
(i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration;	Yes, Strategic National plan
(viii) Restricting the use of dental amalgam to its encapsulated form;	Yes
(ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land	Yes

Key challenges to implementing project component 1 include:

- regulating the sector of importation and distribution of dental amalgam containing mercury;
- raising awareness amongst the personnel, insurance policies and dental material suppliers for the use of alternative materials to dental amalgams; and,
- strengthening legislation against the importation and fraudulent distribution of products containing mercury.

Key opportunities to implement project component 1 include:

- the flexibility of insurance policies in terms of healthcare reimbursement because there is no distinction on the use of materials that are used;
- the availability of alternative materials in Senegal (i.e. glass cement ionomer, composite) as well as the level of continuing education of dental personnel, especially in the private sector, in relation to technological innovations;
- active NGOs and national commitments to implement the provisions of the Minamata Convention;
- revision of the biomedical waste management plan with consideration of liquid waste including mercury; and,
- there is an increasing preference for oral health professionals in using composite materials instead of amalgams, especially in the public health sector.

### 7.3. An innovative approach to model dental restorative materials global consumption – preliminary results

**Presenter:** Yuka Makino, Technical Officer for Oral Health, WHO Regional Office for Africa (AFRO)

The proposed draft Global Oral Health Action Plan which will be discussed and endorsed at the next World Health Assembly includes the global target 1.2. ‘By 2030, 90% of countries have implemented measures to phase down the use of dental amalgam as stipulated in the Minamata Convention on Mercury or have phased it out’.<sup>3</sup> Due to the lack of available data and monitoring models on dental amalgam consumption, the targets from WHO and health authorities can only be on “actions” and not “consumptions”. There is a major gap in properly assessing the status quo, trends, efficacy of measures, and consumption shifts toward alternatives. Therefore, a potential model of dental restorative materials global consumption is currently under development (see figure 9)

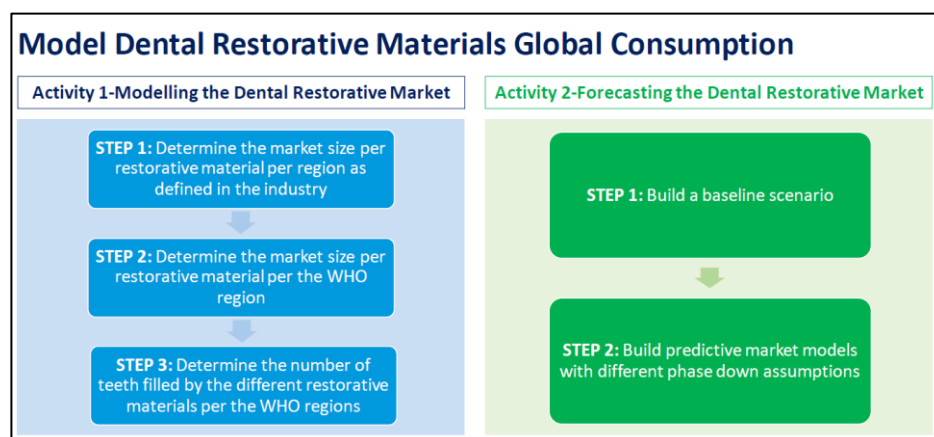


Figure 9. Activities to develop a model of dental restorative materials global consumption

<sup>3</sup> WHO. Draft Global Oral Health Action Plan (2023-2030): [https://cdn.who.int/media/docs/default-source/ncds/mnd/oral-health/eb152-draft-global-oral-health-action-plan-2023-2030-en.pdf?sfvrsn=2f348123\\_19&download=true](https://cdn.who.int/media/docs/default-source/ncds/mnd/oral-health/eb152-draft-global-oral-health-action-plan-2023-2030-en.pdf?sfvrsn=2f348123_19&download=true)

Based on activity 1, a baseline scenario was constructed to predict the future and challenges ahead using a historical compound annual growth rate (CAGR) with no phase-down as part of activity 2 (see figure 10).

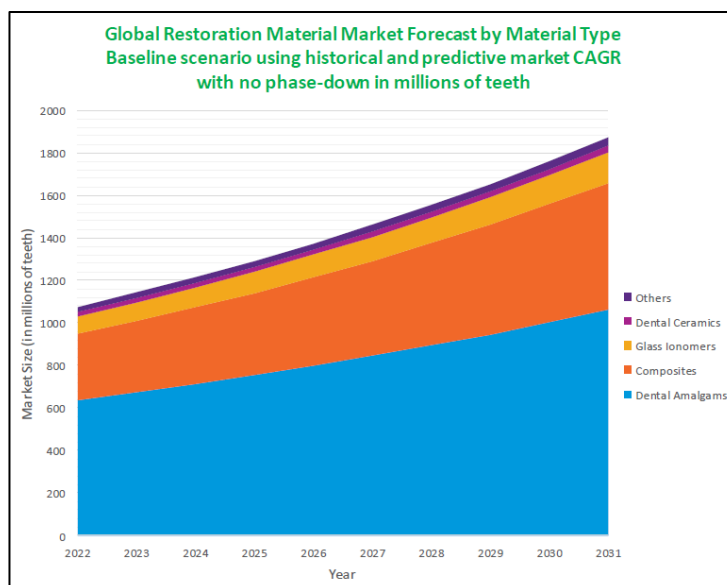


Figure 10. Global restoration material market forecast by material type - baseline scenario

A predictive model was then built based on current status, trends, relative market sizes within the WHO regions and phase-down timelines. There are two predictive models (see figure 11):

- Realistic model: if markets were using amalgam at a high proportion today and had very vague plans to phase down.
- Optimistic model: if markets had very low use of amalgam today, and if they all had a clear plan to phase out.

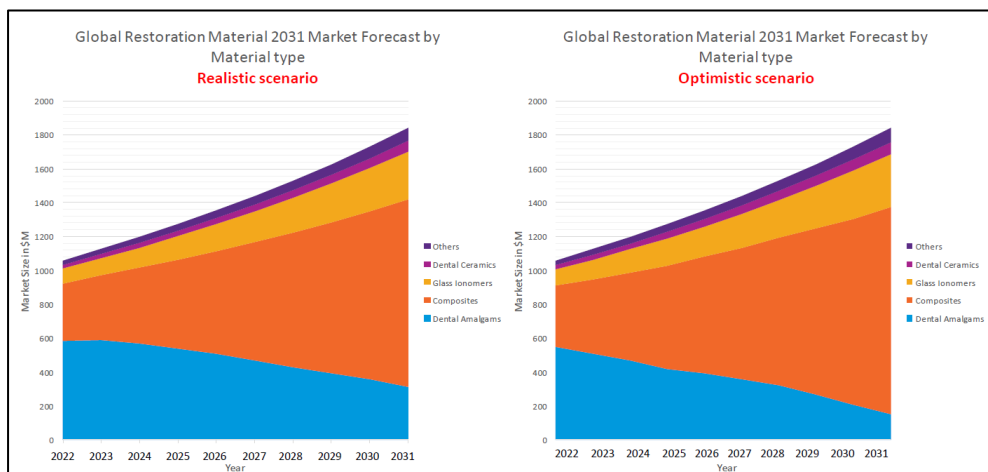


Figure 11. Global restoration material 2031 market forecast by material type – realistic (left) and optimistic (right) scenarios

As mentioned, these are preliminary results of the model and this work is ongoing. One of the limitations is the reliability of data, including the market size in monetary value, which is different across the WHO regions due to the lack of availability of data. To refine the model, there is a need to increase the confidence level, for example, by conducting primary market research across South-East Asian Region, African Region, Eastern Mediterranean Region, and Western Pacific Region.

#### 7.4. Thailand context: challenges and opportunities to improve policies and technical capacity to phase down dental amalgam use

**Presenter:** Surat Mongkolnchaiarunya, Department of Health, Ministry of Public Health, Thailand

Thailand is located in South-East Asia with a population of 66.09 million (2022). The total expenditure on health as % of GDP (2020) is 4.6% and the total expenditure on health per capita is Int\$ 658/year (2020).

The health service system in Thailand has dentists working at every level of the health services delivery system (see figure 12) except at the sub-district level. Approximately 40% of Health promoting centres (at the primary care level) have dental nurses. Dental nurses in Thailand work similarly to dental therapists in other countries.

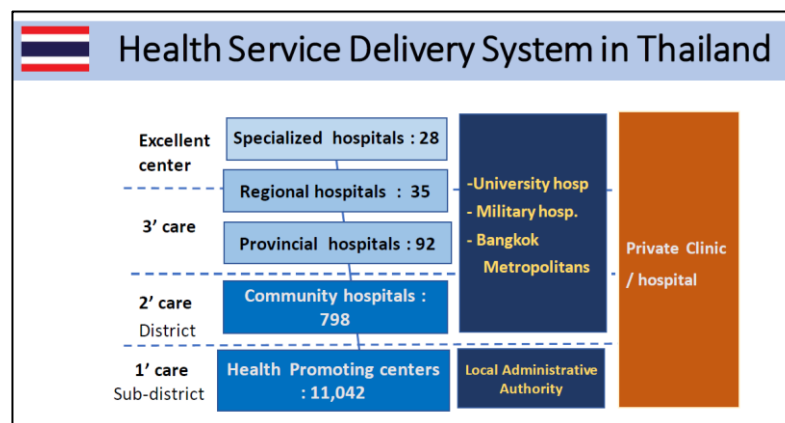


Figure 12. Thailand health system structure

There are three public health insurance schemes in Thailand, all of them providing dental restoration as an item of the Oral Health Benefits:

- Civil Servant Medical Benefit Scheme for civil servants and their dependents (6.7% of the Thai population covered);
- Social Security Scheme for private sector employees/factories (17.2%); and
- Universal Coverage Scheme (76.1%).

There are around 16,697 dentists in Thailand, with 48% of them working in the public sector and 52% in the private sector. There are around 6,739 dental nurses, with most of them (4,345) working at the primary care level.

Thailand conducts a national oral health survey every five years. In 2017, the prevalence of dental caries in all age groups was high, with 5-year-olds having the highest prevalence of 75.6%.

The following activities have been conducted in Thailand, in line with the Minamata Convention on Mercury:

Year	Activity
2017	The Department of Health communicated the Minamata Convention to dental personnel
2018	The Department of Health: <ul style="list-style-type: none"> <li>• promoted health promotion and caries prevention activities;</li> <li>• collaborated with FDA for the import of dental amalgam in capsule form;</li> </ul>

	<ul style="list-style-type: none"> <li>conducted the survey on situation of amalgam use in the Ministry of Public Health facilities; and,</li> <li>studied the amount of mercury released in wastewater from dental facilities.</li> </ul>
2019	<p>The Dental Association of Thailand conducted a seminar on dental amalgam and its effect on health (systematic review) in the Annually Scientific meeting.</p> <p>The Department of Health developed a guideline on dental amalgam use and friendly to environment.</p>
2020	<p>The Department of Health:</p> <ul style="list-style-type: none"> <li>piloted waste management in dental facilities; and</li> <li>started to collect data to prepare for amended measures that Thailand is going to adopt.</li> </ul>

According to the 2018-2019 survey conducted in Ministry of Public Health facilities regarding dental amalgam usage:

- Of 227 hospitals surveyed, 96% used dental amalgam and alternative materials.
- Of the dental filling services provided in 2018, 28% were restored with dental amalgam and 72% with alternative materials.
- The restorative material of choice for primary teeth in children aged under 15 years old was composite resin.

Between 2016 and 2020, the number of fillings made with dental amalgam declined (see figure 13). Moreover, the proportion of fillings made with composite resin is much higher when compared to dental amalgam.

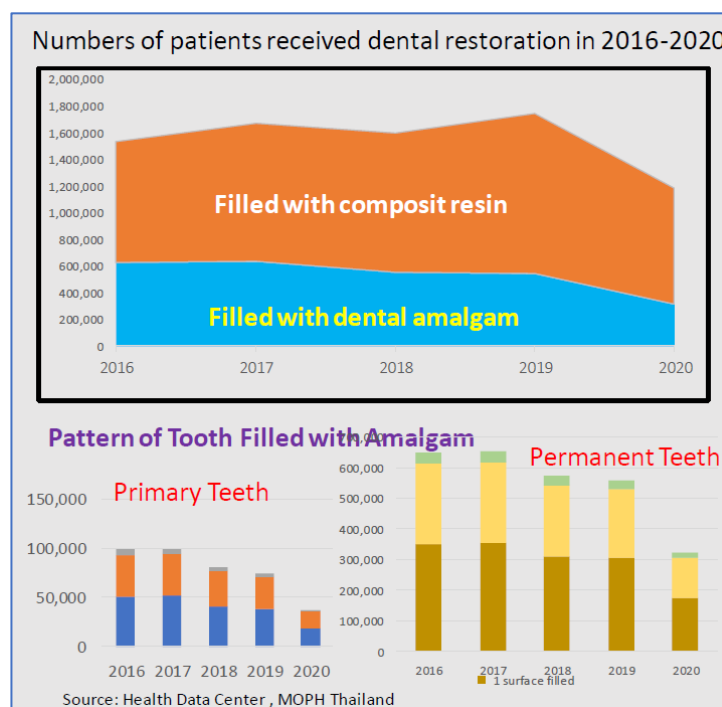


Figure 13. Dental amalgam use in Thailand between 2016 and 2020

An update on the ongoing measures being implemented and some success achieved is based on five measures in line with the Minamata Convention on Mercury (see figure 14).

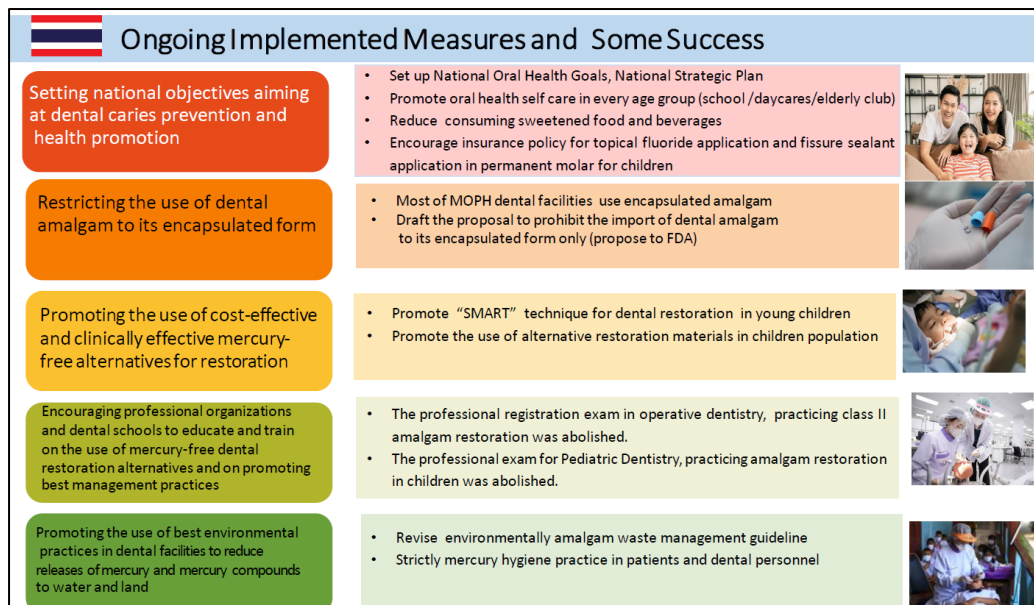


Figure 14. Ongoing implemented measures and some success in Thailand

Opportunities to implement the newly adopted measure at COP4 to exclude or not allow, by taking measures as appropriate, or recommend against the use of dental amalgam for the dental treatment of deciduous teeth, of patients under 15 years and of pregnant and breastfeeding women:

- Continuity of national policies on health promotion.
- Dental caries prevention services are covered by the Universal Coverage Scheme (public health insurance covering the majority of the population). It includes oral exams, topical fluoride application, and sealants in permanent molars for children.
- Measures to control determinants to prevent dental caries are implemented in schools and workplaces.
- Dental restorations (using amalgam or alternative materials) are covered by 3 public health insurance schemes.
- Dental professional organizations and dental schools are aware of the Minamata Convention.

Some challenges concerning the above measures are:

- According to the Decentralization Act 1999, the Health Promotion Centers are devolved to Local Administrative Authorities. They can set their own policies, therefore, collaboration is needed.
- Low coverage of pregnant women register at antenatal clinics of the public hospitals as they prefer private ones. The price of amalgam restoration in the private sector is cheaper compared to alternatives.

## 7.5. Overview of dental caries management: dental amalgam versus quality mercury-free dental materials

**Presenter:** Edward Lo, Professor, Chair of Dental Public Health, Faculty of Dentistry, University of Hong Kong

Dental caries management – ways to reduce dental amalgam:

- Prevention of dental caries through
  - Fluoride toothpaste (self-care) can reduce dental caries by 25%
  - Fluoride varnish (professionally applied) can reduce dental caries by 40%
  - Dental (pit and fissure) sealant can reduce caries by 70%





Figure 15. Fluoride toothpaste (left), fluoride varnish (middle) dental sealant (right) applications

- Non—restorative treatment of decayed teeth
  - Dental caries arrest treatment by using silver diamine fluoride. Around 80% of the treated active carious lesions will become arrested, hard and symptomless. There is no placement of a filling.



Figure 16. Silver diamine fluoride application

- Use alternative materials in dental fillings
  - Glass ionomer cement (GIC) is a chemical-cure material that bonds to dental tissues and can be used in minimal interventions (tooth tissue removal) and atraumatic restorative treatment. It can be easy to apply using hand instruments only. It can be placed in deciduous and permanent teeth.



Figure 17. Glass ionomer cement application after minimal intervention

- Composite resin is a mixture of resin, fillers (such as silica) and other components. It has good physical properties (such as strength and wear-resistance) and it is tooth-coloured. It adheres to the tooth through chemical etching and bonding, and it can be placed with minimal intervention, requiring to remove less tooth tissue in comparison to dental amalgam which makes it a good alternative. However, this treatment involves a series of carefully administered steps and therefore it requires more training for dental operators.



Figure 18. composite resin restoration after minimal intervention

Systematic reviews show that:

- survival/success rate of high-viscous GIC fillings in primary teeth is similar to those of composite resin or amalgam fillings, and there is a high restoration survival rate in permanent teeth (around 80% after 5 years);
- GIC filling has a better preventive effect on new caries than other restorative materials; and,

- the annual failure rate of composite resin fillings in primary molars is low (2% to 13%); however, composite resin fillings may have a higher failure rate than amalgam fillings in permanent posterior teeth. Even though it has good physical properties, there is a higher risk of developing secondary caries, therefore, it should be accompanied by appropriate prevention strategies.

## 7.6. Uruguay context: challenges and opportunities to improve policies and technical capacity to phase down dental amalgam use

**Presenter:** Adriana Otheguy, Programa de Salud Bucal, Ministerio de Salud Publica, Uruguay

Uruguay is located on the southeastern coast of South America and has a population of around 3.5 million people, with the majority of them located in Montevideo the capital of the country. Uruguay was one of the first countries to become parties to the Minamata Convention on Mercury.

In the health system of Uruguay, the Sistema Nacional Integrado de Salud (SNIS – *Integrated National Health System*) was created in 2007. The SNIS governs the access to health by all Uruguayans financed by the Fondo Nacional de Salud (FONASA – *National Health Fund*) and also by workers' contributions.

In 2008, the oral health programme was created at the Ministry of Health to contribute to the achievement of the highest possible degree of oral health of the Uruguayan population by driving, promoting and articulating the appropriate promotional, preventive and assistance actions integrated into a Health System that correspond to the needs of each individual. The Oral Health Programme implemented changes to switch from a curative model to a preventive model, along with suitable financing and management models.

In 2018, a decree was developed in which dental amalgam was declared as an obsolete material and was eliminated from the oral health services catalogue to be provided by SNIS. In 2022, the Ministry of Health communicated to all SNIS providers (including public and private providers of SNIS) that this decree was being implemented.

To ensure collaboration during the phase down in use of dental amalgam, the Dental Association of Uruguay were urged to remove fees corresponding to dental amalgam. In parallel, a conference was held to inform the oral health community about the evolution of dental amalgam and alternatives, and the linkages to the Minamata Convention on Mercury.

Strengths at the Ministry of Health include the availability of awareness-raising materials and guidance related to oral health and having specific oral health targets with patients under 4 years of age, pregnant women and women who recently gave birth.

Strengths at the Academy level, the Republic University of Uruguay began restricting training on dental amalgam between 2008 and 2011, and by 2013 it was considered to remove it from pre-clinic and clinic practice training. Currently, the dentistry degrees of the Republic University of Uruguay and the Catholic University do no longer include dental amalgam as part of the curricula, but students do learn about mercury waste management.

In the Department of Toxicology at the Republic University of Uruguay, there has been collaboration with the Ministry of Environment to implement a number of GEF projects. In 2011-2012 the mercury toolkit was used to collect data on mercury used in dental facilities from primary care centres and hospitals. In 2018, there was a population survey to assess the mercury level in the Uruguayan population of pregnant women and newborns which showed that, in general, mercury levels were very

low, although it is important to note that only a few of the women that were surveyed had dental amalgams.

In oral health, prevention implies preventing the dental structure from losing its natural integrity. For dental caries specifically, it is important to shift to a model that promotes oral health and prevents and controls dental caries, in all care levels, focussed on minimal intervention approaches that conserve the natural structure of the teeth. The ideal virtuous circle would be engaging with pregnant women and integrating them into an education system for their oral health care and that of their babies so they can maintain good oral health status and avoid the need for dental restorations altogether.

Uruguay will continue:

- generating awareness and informing independent dentists;
- emphasizing primary health care, the first level of care of SNIS;
- counting on allies - the new generations of dentists who do not receive curricular training will be the main allies to completely stop the use of dental amalgam; and
- promoting research on substitute materials for dental amalgam, linked to the possible risks of their use in the future.

## 7.7. Innovative workforce models and training to accelerate phasing down the use of dental amalgam

**Presenter:** Julian Fisher, Center for Integrative Global Oral Health, University of Pennsylvania

The implementation of the Minamata Convention on Mercury is an opportunity to reorient education and the health workforce towards environmentally friendly and less invasive dentistry practices (as stated in measure v of Annex A Part II of the Convention) to achieve the WHO Global target 1.2 on environmentally sound oral health care of the draft WHO Global oral health action plan<sup>4</sup>. This shift would address the environmental challenges related to oral health care including the efficient use of natural resources, such as water and energy, and protect and promote oral and planetary health (WHO Global oral health action plan, action 68).

WHO defines oral health as ‘the state of the mouth, teeth and orofacial structures that enables individuals to perform essential functions, such as eating, breathing and speaking, and encompasses psychosocial dimensions, such as self-confidence, well-being and the ability to socialize and work without pain, discomfort and embarrassment. Oral health varies over the life course from early life to old age, is integral to general health and supports individuals in participating in society and achieving their potential’.<sup>5</sup> This definition opens up opportunities for developing innovative workforce models and training that contribute to the sustainable oral health for all peoples.<sup>6</sup> Setting national objectives aiming at caries disease prevention and oral health promotion (measure i of Annex A Part II of the Convention) can enable interprofessional and transdisciplinary approaches which support and strengthen the integration of oral health into health programmes. Grounding oral health in, between and across the 17 Sustainable Development Goals will enable action to address the social and commercial determinants as key risk factors for poor oral health, as well as training on WHO Health in All Policy Approaches (see figure 19)<sup>7</sup>.

<sup>4</sup> WHO. Draft Global oral health action plan (2023-2030). <https://cdn.who.int/media/docs/default-source/ncds/mnd/oral-health/eb152-draft-global-oral-health-action-plan-2023-2030-en.pdf>

<sup>5</sup> WHO. 2022. Global strategy on oral health. [https://apps.who.int/gb/ebwha/pdf\\_files/WHA75/A75\\_10Add1-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_10Add1-en.pdf)

<sup>6</sup> Fisher, J., R. Berman, K. Buse, B. Doll, M. Glick, J. Metzl, and R. Touger-Decker. 2023. Achieving Oral Health for All through Public Health Approaches, Interprofessional, and Transdisciplinary Education. NAM Perspectives. Discussion Paper, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202302b>.

<sup>7</sup> WHO. 2022. Health in all policies: training manual. <https://www.who.int/publications/i/item/9789241507981>

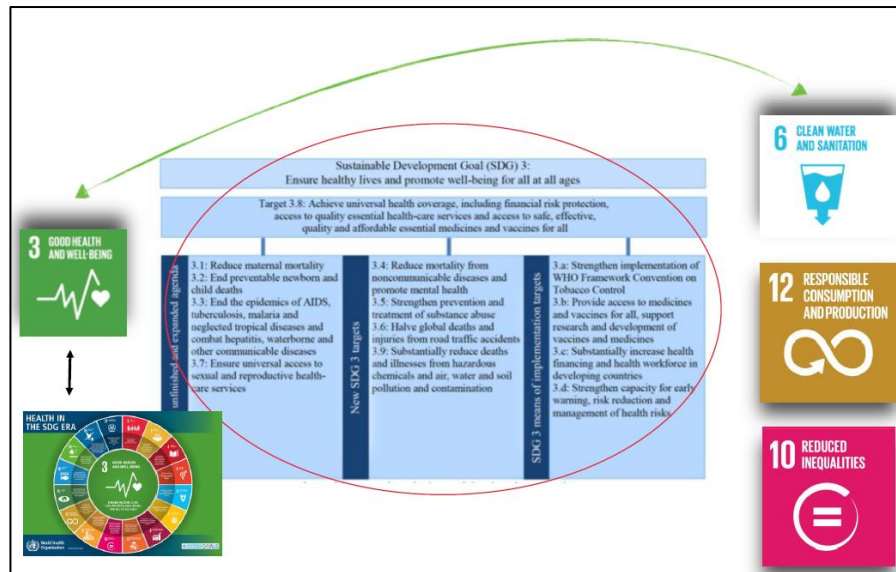


Figure 19. Oral health linkages to sustainable development goals

Innovative workforce models that build on and enhance existing models are needed to improve the use of the health workforce and strengthen networking for oral health services and care across health programmes. Interprofessional and transdisciplinary learning on oral health can contribute to oral health promotion and disease prevention strategies both in the health sector and in sectors outside health but which impact health, for example neglected tropical diseases (Sustainable Development Goal 3.3).

Lifelong learning systems for health workforce education including collaborative practice education can help guide and inform the shape and form of a community-based engaged and distributed oral health workforce.<sup>8</sup> For example, in the states of Oregon, Colorado and Wisconsin in the United States of America, the use of the expanded practice dental hygienist in primary care settings, mobile community clinics and hospitals has improved the provision of oral healthcare to vulnerable and disadvantaged populations and provided effective referral pathways to dental services providers. Similar examples exist in low- and middle-income countries. For example, Matabeleland in Zimbabwe where an oral health unit provides essential oral healthcare in a large regional mental health hospital, and acts as a hub to provide caries prevention and oral health promotion education to the wider mental health workforce. These innovative workforce models demonstrate how the broader health workforce can contribute to better oral health for all and support the holistic care of patients in health facilities while respecting health workforce regulation and scopes of practice.

An important consideration to achieve environmentally friendly and less invasive dentistry is by implementing measure i of Annex A Part II of the Minamata Convention which states 'Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration'. This can be achieved by embracing mercury-free dental materials such as fluoride, silver diamine fluoride, and minimal intervention with glass ionomer cement – all of which are listed as part of the WHO Essential Medicines List and Essential Medicines List for Children.<sup>9</sup> A shift to environmentally friendly and less invasive dentistry can also address the environmental challenges related to oral health care including the efficient use of natural resources such as energy and water. Efforts to protect and promote oral and planetary health should be included in the planning and processes for the development of national action plans.

<sup>8</sup> WHO. 2023. Strengthening the collection, analysis and use of health workforce data and information: a handbook <https://www.who.int/publications/i/item/9789240058712>

<sup>9</sup> WHO Model Lists of Essential Medicines. <https://www.who.int/groups/expert-committee-on-selection-and-use-of-essential-medicines/essential-medicines-lists>

Evidence based caries classification and management system that encourages minimizing the need for dental restoration including dental amalgam (measures i. & ii)	Degree of invasiveness	Technologies and techniques that enable the adoption of less invasive dentistry
ICDAS 0	Non-invasive	WHO Essential Medicines (Fluoride)
ICDAS 1 -2	Micro-invasive	WHO Essential Medicines (Silver diamine fluoride)
ICDAS 3-4 ICDAS 5-6	Meso-invasive	WHO Essential Medicines (Glass ionomer cement)
	Macro-invasive	Dental extractions

Protect and promote oral and planetary health

Consider and adopt environmentally friendly dentistry (measures v. & ix)

Figure 20. Evidence based caries classification and management system (figure supplied after meeting)

Oral health workforce education and training will need to address the social determinants of health, including gender issues, when implementing national action plans to phase down the use of dental amalgam.<sup>10</sup> Key reference documents for the development of national action plans are reports from the Lancet Commission on Oral Health, and forthcoming WHO publication ‘Integrating social determinants of health into health workforce education and training: a starter guide’ which has a chapter on oral health.

Adaptation of accreditation mechanisms for the oral health workforce are needed to ensure a comprehensive approach that aligns best environmental practices (as stated in measures v and ix of Annex A Part II of the Convention) and competencies towards achieving universal health coverage. Resources such as WHO National Workforce Accounts<sup>11</sup> and WHO Global Competency Framework for Universal Health Coverage<sup>12</sup> can support mapping the oral health workforce and identifying the competencies and skills required to meet the oral health needs of the population and support countries with their implementation of the Minamata Convention on Mercury.

## 7.8. Group discussion and Q&A

- Currently, the project team is considering using the UNEP mercury toolkit<sup>13</sup> to develop the national assessments tool in project countries on the inventory of trade (including possible diversion to non-dental use). This assessment tool would be beneficial for not only three countries in the project but also for the situation analysis of other countries to implement the phase down in use of dental amalgam. Moreover, the project team will seek to access technical input through the Global Mercury Partnership network of experts and relevant project partners to support the delivery of this project activity.
- For the project activity aiming at establishing or improving regulations and policies in project countries, although it is not specifically mentioned in the project document, the additional mandatory measures in Annex A Part II that were adopted at COP4 will be integrated into the relevant project activities (e.g. insurance policies, training of health workforce, regulations). It

<sup>10</sup> Nicole Valentine and others, Planetary health benefits from strengthening health workforce education on the social determinants of health, Health Promotion International, Volume 37, Issue 3, June 2022, daac086, <https://doi.org/10.1093/heapro/daac086>

<sup>11</sup> WHO. 2017. National health workforce accounts: a handbook. <https://apps.who.int/iris/handle/10665/259360>.

<sup>12</sup> WHO. 2022. Global competency framework for universal health coverage. <https://www.who.int/publications/i/item/9789240034686>

<sup>13</sup> UNEP. Toolkit for identification and quantification of mercury releases. <https://www.unep.org/explore-topics/chemicals-waste/what-we-do/mercury/mercury-inventory-toolkit>

is the purpose of the project to accelerate the implementation of the Minamata Convention and integrate any past and future decisions made by the COP during the project lifecycle.

- The importance of primary and secondary prevention is the optimal way to avoid dental caries which ultimately minimizes the need for dental restoration, including the use of dental amalgam. For example, for the project activity related to public and private insurance policies and programmes, the assessment should be beyond the use of mercury-free alternatives, it should also cover oral health promotion and preventative programmes.
- Although it is important to consider the market for restorative conventional materials, it is important to consider other materials that are non-operative interventions, such as silver diamine fluoride, fluoride varnish as well as innovative biomimetic technologies for early lesion remineralisation.
- Collaboration opportunities could be sought with WHO AFRO and WHO Collaborating Centres for the development of an e-learning course tailored to the oral health workforce to support countries in phasing down the use of dental amalgam.

## 8. Project component 2 session

### 8.1. Project component 2 scope: outcomes, targets, deliverables

**Presenter:** Benoit Varenne, Dental Officer, Oral Health Programme, NCD Department, WHO

The second component of the project is titled ‘Improve management of mercury and hazardous waste from dental use’. Dental amalgam is a large source of mercury pollution (see figure 21). It is often the largest source of mercury in municipal wastewater. It can reach the soil through waste disposal mechanisms and through the burial of people who have dental amalgam in their mouths. It can also cause mercury air pollution through the incineration of mercury-containing waste and crematoria.

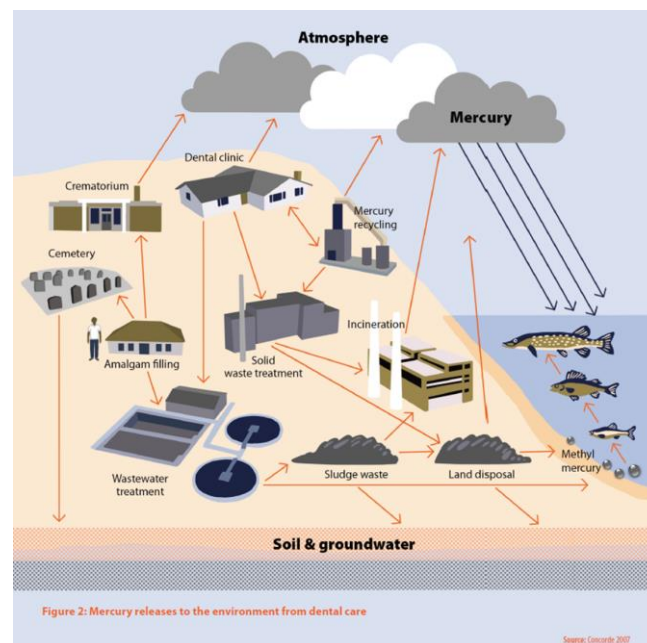


Figure 21. Mercury releases to the environment from dental care<sup>14</sup>

Therefore, while we are aiming to reduce the use of dental amalgam through component 1, in parallel, the second component of the project will focus on the environmentally sound lifecycle management

<sup>14</sup> UNEP. 2016. Lessons from countries phasing down dental amalgam use. <https://wedocs.unep.org/bitstream/handle/20.500.11822/31212/Dental.pdf>

of dental amalgam wastes to reduce emissions to air and releases to land and water of mercury and mercury compounds in the 3 countries.

The expected outcome of this component is the ‘sound management practices to handle dental amalgam and their wastes adopted by selected dental facilities in the three countries through demonstration of different disposal schemes’. The output is ‘feasibility on the application of sound management and disposal schemes for dental amalgam are tested and dental wastes transported and disposed of’.

There are two main targets to achieve in this component:

- 10% increase in dental facilities with sound dental amalgam management techniques.
- Identified health facilities acquired new amalgam separators and adopted best management practices to handle dental amalgam wastes.

There are four main activities included in project component 2, each with concrete deliverables (see figure 22). The project main activities can be adapted according to the national context of each target country as each of them are at a different stage in phasing down the use of dental amalgam.

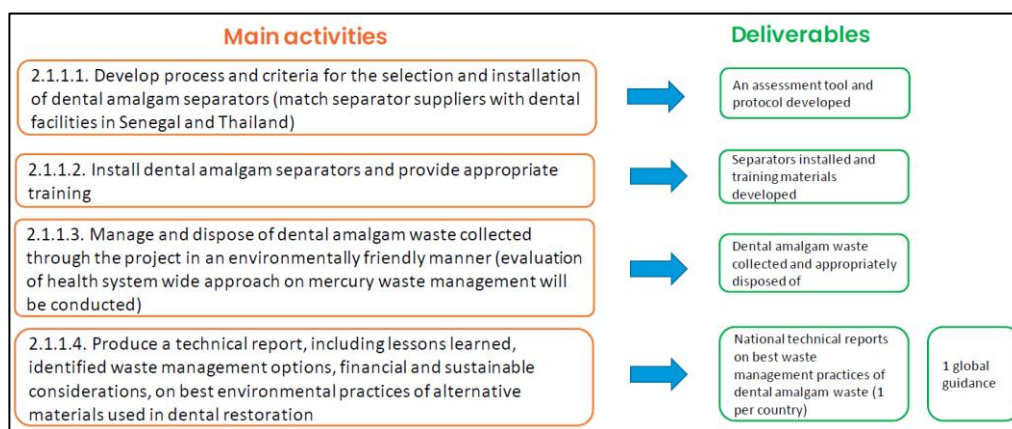


Figure 22. Main activities and deliverables of project component 2

The project will document and support the process of procuring, installing, training and maintaining amalgam separators, as well as the collection, treatment and disposal – in an environmentally sound manner – of dental mercury waste, including associated operational research on cost-effectiveness and sustainability aspects of amalgam separators to better understand their viability in the context of different countries. Beyond the use of amalgam separators, the project will also broadly disseminate other best environmental practices that can be done to reduce generation and to implement proper management of dental amalgam waste and other associated wastes, and promote the integration of dental amalgam waste management within broader mercury waste management processes at national health care system.

## 8.2. National context, challenges and opportunities to improve management of mercury and hazardous waste from dental use in Senegal

**Presenter:** Pathé Dieye, Minamata Convention focal point, Ministry of Environment, Senegal

According to the Minamata Initial Assessment, the result of the Level 1 mercury inventory indicated that, there was approximately between 50,000-60,000 kg Hg/year of mercury releases and emissions in Senegal. Most mercury is smuggled into the country which adds a layer of difficulty when aiming at regulating the use of mercury in dental amalgam.

The mercury waste management needs for the country are:

- Lack of information on waste management for dental amalgam, especially because waste containing mercury is mixed with general waste, which makes it difficult to identify the exact quantities of mercury waste circulating in the country.
- There is a need to develop a law that specifically deals with the management of mercury-containing waste, in line with the Minamata Convention on Mercury. In terms of legislation, the country has the following texts:
  - Law 2001-01 of January 15, 2001, on the environment code which generally deals with all types of waste.
  - Decree No. 2008-1007 of August 12, 2008, regulates the management of biomedical waste, but not specifically on mercury waste.
  - Decree No. 2010-1281 of September 16, 2010, regulates the conditions of use of lead from used batteries and other sources and the use of mercury and its compounds, but not specifically on dental amalgam.



Figure 23. Mercury waste management needs in Senegal

There are many challenges in the management of mercury and hazardous waste for dental use in developing countries; including:

- Lack of political support, change in the political agenda and priorities of the State which often are oriented towards the construction of infrastructure;
- Ministry of the Environment are not Ministries of Sovereignty, therefore, their decisions cannot override those of other ministries;
- Lack of financial resources from development partners;
- Lack of receptivity on the part of the public who do not understand the dangers associated with the use of mercury in dental amalgams;
- Lack of interest from private partners, especially those involved in the trade of mercury-added products; and
- Political, economic and security crisis.

Opportunities for improving mercury and dental hazardous waste management:

- It is necessary to elevate the Ministry of the Environment into Ministries of Sovereignty whose decisions can be made binding on all institutions;
- Senegal has several structures involved in mercury waste management. It is necessary to set up a coordination unit at the level of the ministries of the environment and to train the agents in charge of dangerous chemical products management on the best technologies;



- The experience capitalized through the dioxins and mercury management project (PROGEDIME) has made it possible to better understand the issues related to the management of mercury-added products;
- This project is an opportunity to create a centre specializing in the management of hazardous waste containing mercury; and
- The Ministry of Environment has acquired a mobile laboratory for measuring local mercury pollution, but there are difficulties in maintaining this equipment. It was suggested to develop an indicator titled ‘Rate of mercury eliminated’ which could be supported by the results of this project.

### 8.3. Policy guidance and lessons learned from phasing out of mercury thermometers and sphygmomanometers in healthcare

**Presenter:** Margaret Montgomery, Water, Sanitation, Hygiene and Health Team, WHO

Billions of people are served by healthcare facilities without water, sanitation, hygiene (WASH) and waste services, and in these situations, it undermines the efforts of appropriately handling mercury waste management. However, there are commitments to make progress on WASH and waste through the adoption of the 2019 resolution WHA 72.7.<sup>15</sup>

Healthcare facilities’ mercury releases into the atmosphere most commonly come from the incineration of mercury-containing medical waste. Healthcare facilities may also be responsible for mercury pollution taking place in water bodies from the release of untreated wastewater. Breakage of mercury thermometers and sphygmomanometers, if not dealt with appropriately, can result in occupational (and patient) exposures.

The WHO guidance ‘Developing national strategies for phasing out mercury-containing thermometers and sphygmomanometers’ provides a wealth of experience and lessons learned to facilitate the development of health-system-wide approaches:<sup>16</sup>

- Step 1: Develop a stakeholder engagement strategy: Identify all stakeholder groups needed to support the roll-out and establish a process for their engagement.
- Step 2: Situation assessment and inventory: Understand the number and quantity of medical devices requirement replacement or substitution, waste assessment, and the capacity and cost associated with phase-out scenarios.
- Step 3: Strategy development and implementation: Training and sensitization to support the switch to alternatives, and testing alternatives to ensure relevant regulatory requirements are in place.
- Step 4: Monitoring and reporting: Monitoring of results of interventions and supporting activities to detect and report on unforeseen issues/impacts related to the implementation of measures under the strategy.

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<sup>15</sup> World Health Assembly, 72. (2019). Resolution WHA72.7: [https://apps.who.int/gb/ebwha/pdf\\_files/WHA72/A72\\_R7-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_R7-en.pdf)

<sup>16</sup> WHO. 2015. 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: <https://www.who.int/publications/i/item/9789241508339>



Figure 24. WHO Guidance on Developing national strategies to phase out mercury-containing thermometers and sphygmomanometers

There is an urgent need to strengthen health engagement and leadership in the Minamata Convention implementation efforts. Some of the key findings in the WHO Review of Minamata Convention Initial Assessment (MIA) reports were that only in half of the responding countries (n=61) Ministries of Health were not involved in developing MIAs, and fewer than 1/3 MIAs indicated measures to address mercury in health care waste.<sup>17</sup> There is a need for appropriate infrastructure to safely transport, store and dispose of healthcare waste, including mercury-containing waste.

Key insights from strengthening safe health care waste management, including phasing out mercury in Ghana, Madagascar, Tanzania and Zambia, include:

- understanding existing quality standards and processes and work to strengthen them;
- understanding who owns the medical devices and what needs replacing; and
- training on the use of new devices and put in systems to ensure operation and maintenance.

#### 8.4. National context, challenges and opportunities to improve management of mercury and hazardous waste from dental use in Thailand

**Presenter:** Napaporn Tangtinthai, Pollution Control Department, Ministry of Natural Resources and Environment, Thailand

The hazardous and waste management in Thailand was recently changed to use decentralized policy, therefore, it is the responsibility of local governments overseen by the Ministry of Interior, and supported by the Ministry of Industry, Ministry of Public Health and Ministry of Natural Resources and Environment (see figure 25).

<sup>17</sup> WHO. 2021. Review of Minamata Convention initial assessment reports: key findings for health. <https://www.who.int/publications/i/item/9789240041011>



Figure 25. Hazardous waste management in Thailand using decentralized policy

There is the Ministerial Regulation on Management of Toxic and Hazardous Waste from the Community, B.E. 2563 (2020) under the Public Health Act B.E. 2535 (1992). Currently, Thailand is in the process of preparing 12 notifications of the Ministry of Public Health including but not limited to the management of toxic and hazardous waste from the community training courses for responsible officers and operators, determination of methods for managing toxic and hazardous waste from the community; determination of seal or symbol on containers for collecting toxic and hazardous waste from the community; criteria for location and size of the burning area of an incinerator.

The Ministry of Natural Resources and Environment support local governments through guidelines and technical advice for hazardous waste management. It enables cooperation between the public and private sectors on hazardous waste management for local communities. It also encourages to have drop-off points covering communities across the country.

The following is a concept on toxic and hazardous waste from the community to prepare the 12 notifications of the Ministry of Public health (see figure 26). Local governments need to understand the different types of waste so these can be sorted and collected correctly, followed by safely transporting the waste to the appropriate disposal sites.

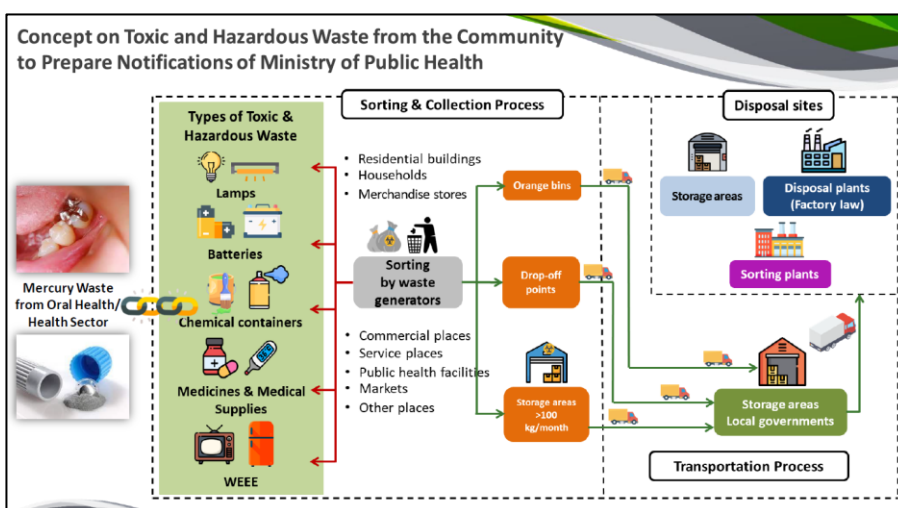


Figure 26. Concept on toxic and hazardous waste from the community to prepare notifications of the Ministry of Public Health

Challenges and opportunities in Thailand are as follows:

- The National sub-committee on the Convention acts as a mechanism in Thailand to support the implementation of the Minamata Convention on Mercury. The Department of Health is a member of the sub-committee.
- Thailand is currently working to develop an Advanced Minamata Assessment which includes developing the National inventory of mercury and there is an opportunity to link it with the relevant project activity in component 1 to develop a dental amalgam inventory.
- This is a period of changes in the national organizational structure of hazardous waste management (including mercury waste from the oral health/health sector) in Thailand and an opportunity to showcase the change from centralized policy to decentralized policy.

## 8.5. Mercury waste management

**Presenter:** Kenneth Davis, Global Mercury Partnership Secretariat, UNEP

The UNEP's Global mercury supply and demand report show that mercury is coming from different sources, and about a third of the total global demand belongs to mercury-added products including dental amalgam (see figure 27).<sup>18</sup> After mercury is used in mercury-added products, there are different pathways that lead to mercury reaching the environment (e.g. during placement of dental amalgam), long-term storage or environmentally sound disposal, recovery and recycling, but the majority will result in mercury accumulated in society (e.g. dental amalgam in the mouths of people). Ultimately, the aim is to reduce the global supply and demand of mercury, and to ensure that mercury-containing waste is managed adequately. For dental amalgam, the global mercury consumption is estimated to be 274 tons/year.

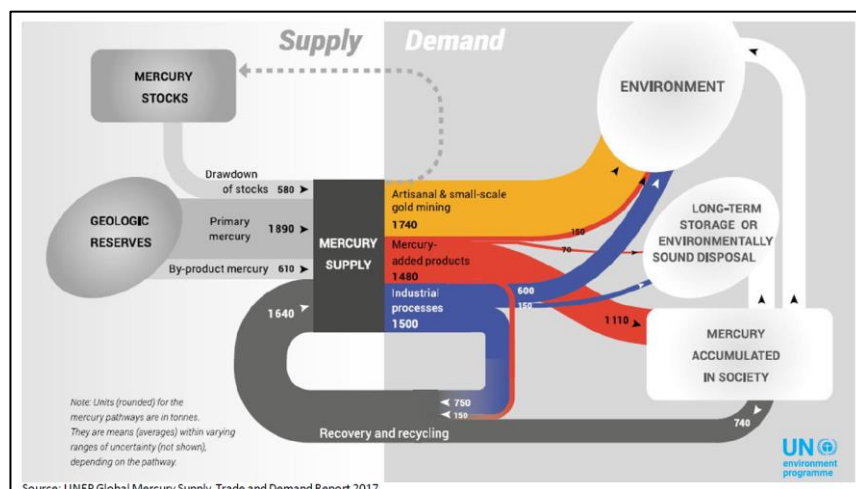


Figure 27. Global mercury supply and demand

The fate of mercury used in dental amalgam can be as follows:

- Waste generated during placement of dental amalgam, filling removal or tooth extraction (e.g. dental waste, other solid waste, chairside trap or amalgam separator waste)
- Releases to sewage systems
- Excess mercury in dental offices (e.g. bulk mercury in the facility)
- End of life (e.g. burial or cremation)

Obligations in alignment with the Minamata Convention on Mercury include:

- Article 11 – Mercury Wastes – requirements on Parties:

<sup>18</sup> UNEP. 2017. Global mercury supply, trade and demand.

[https://wedocs.unep.org/bitstream/handle/20.500.11822/21725/global\\_mercury.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/21725/global_mercury.pdf?sequence=1&isAllowed=y)

- Manage mercury waste in an environmentally sound manner, taking into account guidelines developed under the Basel Convention;
- Mercury recovered from waste may only be disposed of in an environmentally sound manner or re-used for a use allowed under the Convention; and,
- International transport by Basel Convention (for Basel Parties)
- Article 4 and Annex A– Mercury-added products – relevant points:
  - One measure is Annex A Part II is the promotion of the use of best environmental practices in dental facilities to reduce releases of mercury to the environment;
  - Note the amendment to Annex A Part II that prohibits the use of mercury in bulk form by dental practitioners.

Mercury waste management principles, relevant to dental amalgam, from the Basel Convention's Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury or mercury compounds:<sup>19</sup>

Step	Key considerations
Handling	<ul style="list-style-type: none"> <li>● Special attention to the prevention of evaporation and spillage.</li> <li>● Proper personal protective equipment, also taking into account other risks (e.g. biological).</li> </ul>
Separation, packaging and labelling	<ul style="list-style-type: none"> <li>● Do not mix mercury wastes with other waste streams, such as municipal solid waste.</li> <li>● Label clearly as required by local regulations, export requirements, and other guidance from waste management facilities (e.g. contact dental amalgam waste).</li> <li>● Packaging should be airtight, resistant to breakage and leakage.</li> </ul>
Collection	<ul style="list-style-type: none"> <li>● Collect mercury waste separately from other waste streams.</li> <li>● Collection systems depend on the amount of waste, geography, availability of storage.</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>● Shipping papers need to contain appropriate information such as contact number, waste description, UN number (e.g. UN 2809).</li> <li>● Shipment in accordance with applicable regulations, depending on mode of transport (air, sea, road).</li> <li>● Chain of custody to the final destination.</li> </ul>
Storage	<ul style="list-style-type: none"> <li>● Temporarily, until collection for disposal (may be national regulations on storing waste).</li> <li>● Separate from other wastes and items.</li> <li>● Secure and well-marked.</li> <li>● Safe – separate ventilation, impermeable floor, fire prevention, monitoring.</li> </ul>
Treatment	<ul style="list-style-type: none"> <li>● Treatment standard for dental amalgam waste is typically thermal treatment followed by recovery of mercury and either recycling or conversion to a less reactive form for final disposal.</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>● Stabilization, solidification, placement in specially engineered landfill or underground facility.</li> </ul>

Examples of environmentally sound management of dental amalgam waste are represented in figure 28 and figure 29.

<sup>19</sup> Basel Convention. 2015. Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury or mercury compounds.

<http://www.basel.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/TechnicalGuidelines/tabid/8025/Default.aspx>

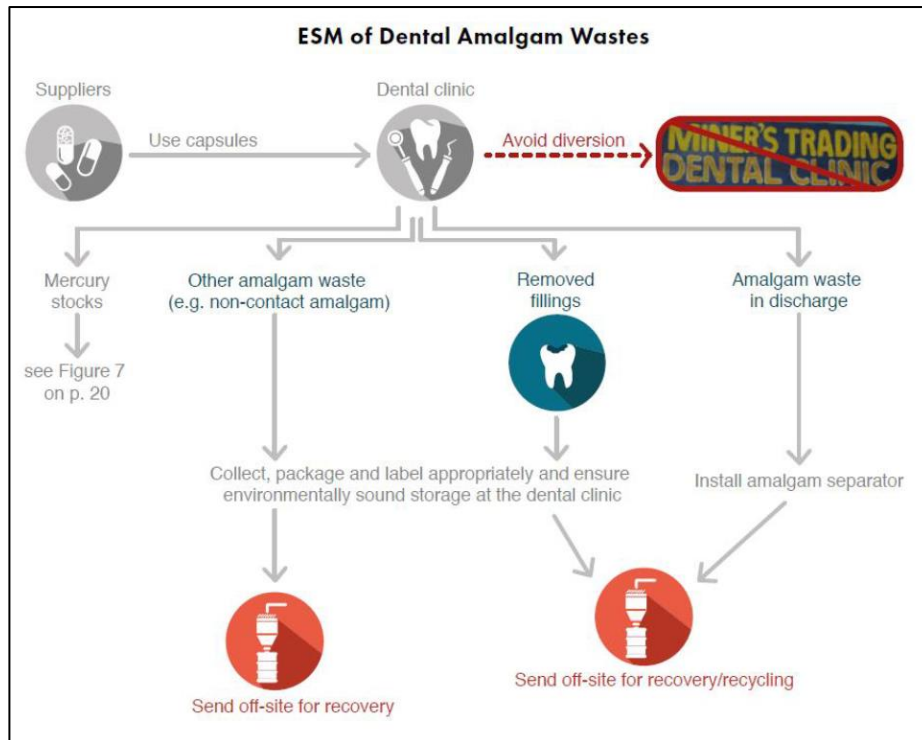


Figure 28. Environmentally sound management of dental amalgam wastes <sup>20</sup>

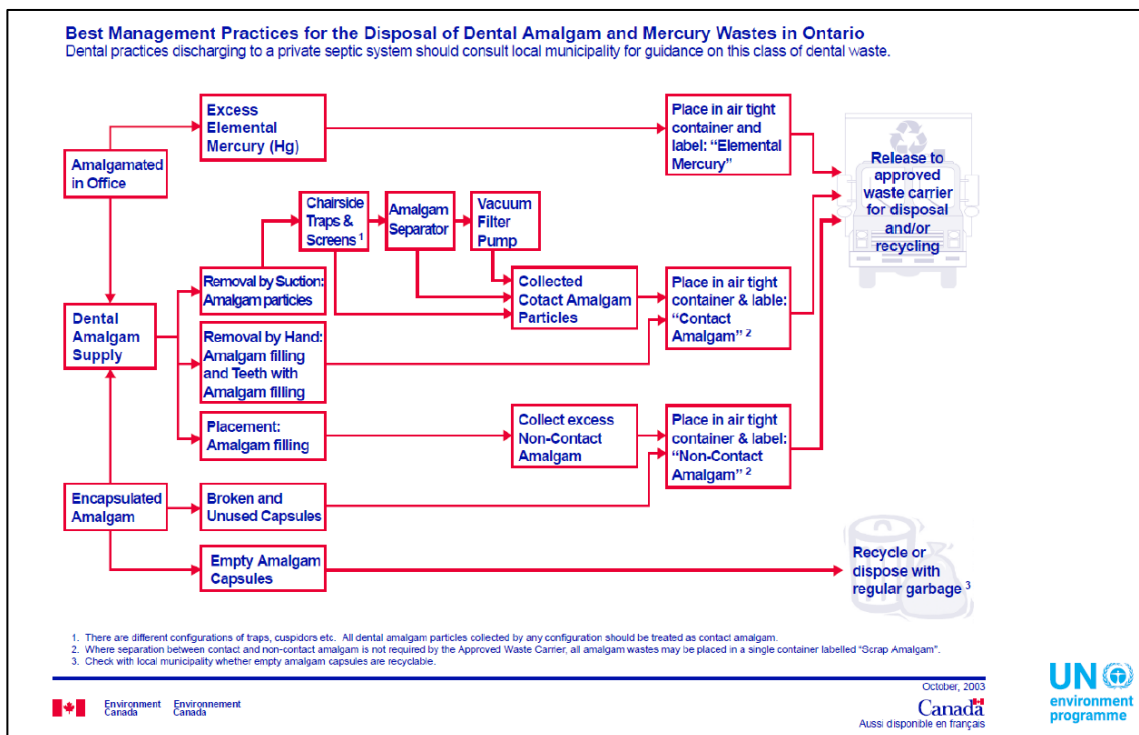


Figure 29. Best management practices for the disposal of dental amalgam and mercury wastes in Ontario, Canada

<sup>20</sup> UNEP. 2015. Practical sourcebook on mercury waste storage and disposal. <https://www.unep.org/resources/report/practical-sourcebook-mercury-waste-storage-and-disposal-2015>

## 8.6. National context, challenges and opportunities to improve management of mercury and hazardous waste from dental use in Uruguay

**Presenter:** Judith Torres, Minamata Convention focal point, Ministry of Environment, Uruguay

Since 2018, Uruguay has conducted different activities to understand the national situation, including using the UNEP's mercury toolkit on emissions and releases to identify main sources of mercury stockpiles, and conducting different projects related to addressing mercury waste management and the end-of-life of mercury-added products. A recent Decree 15/2019 is related to the environmentally sound management of lamps and other mercury waste.

During the last GEF-funded project in Uruguay titled 'Environmental Sound Life-Cycle Management of Mercury Containing Products and their Wastes', guidelines for the storage of different types of mercury waste from mercury-added products, including dental amalgam, were produced.<sup>21</sup> There was a close collaboration with the academia, including the development of a dental amalgam report from the Faculty of Dentistry<sup>22</sup> and their participation in workshops organized related to dental restoration for dissemination of information. Moreover, there were partnerships with the Ministry of Health and CIAT (a Poison centre of Uruguay and WHO collaborating centre). The Dental Professional Association in Uruguay was also engaged to conduct a questionnaire on dental amalgam usage amongst its members. Activities have also been focused on developing waste treatment capacities for dental amalgam stockpiles. Policy measures to address the phase down the use of dental amalgam in Uruguay by the Ministry of Health were described earlier by the Chief Dental Officer. Ministry of Environment web page materials published during these years and can be accessed at: <https://www.gub.uy/ministerio-ambiente/mercurio>.

The declared import between 2007 to 2016 is reflected in Figure 30. The estimated mercury emissions from dental amalgam in Uruguay is 49 kg/year which resulted from the application of the UNEP Mercury toolkit in 2015.

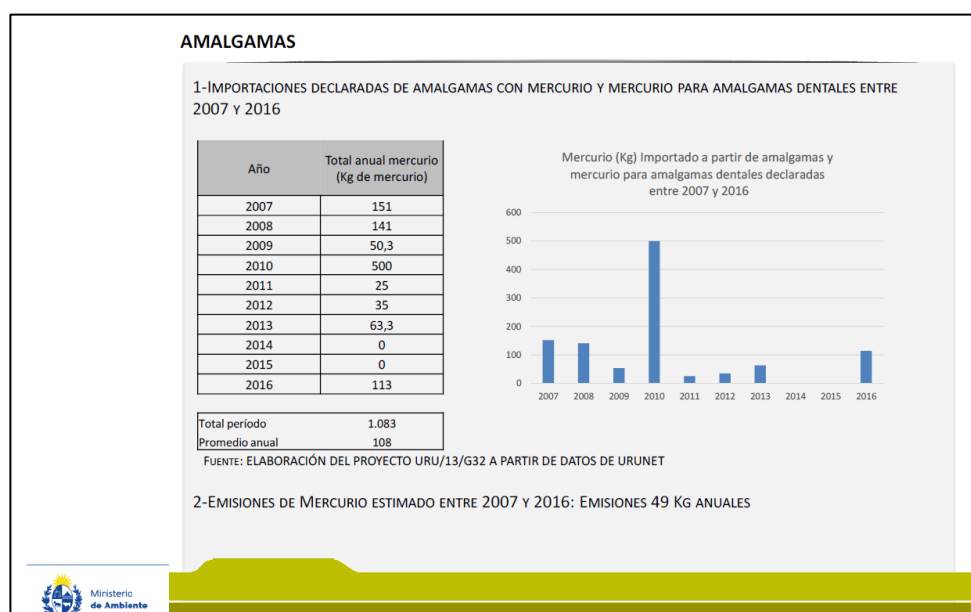


Figure 230. Dental amalgam importation data and mercury emissions between 2007 and 2016 in Uruguay

<sup>21</sup> GEF-5 Project ID 4998. Environmental Sound Life-Cycle Management of Mercury Containing Products and their Wastes. <https://www.thegef.org/projects-operations/projects/4998>

<sup>22</sup> Amalgama Dental y Control del Mercurio: Informe Facultad de Odontología (UdelaR). <https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/informe-amalgama-dental-control-del-mercurio>

For this GEF7 Phasing Down Dental Amalgam Project, there is a close partnership between the Ministry of Health, Ministry of Environment, CIAT (WHO Collaborating Centre), WHO Uruguay and Regional Office for the Americas (PAHO).

Some of the challenges identified for the project include:

- updating stockpiles at the country level because Uruguay conducted one already a few years ago;
- developing a sustainable collection system and waste treatment in place for dental amalgam; and
- reporting on the availability of mercury-free alternatives at the national level including assessment of feasibility, costs, as well as health and environmental risks and impacts.

Some of the opportunities identified for the project are:

- developing national capacity building to manage dental amalgam across its life cycle;
- close collaboration with academia and private sector on alternative materials and waste treatment;
- implementation of the Minamata Convention dental amalgam policy measures (identify gaps for improvement);
- development of awareness raising and training material; and
- national contribution to lessons learnt on Uruguay's experience to phase down the use of dental amalgam.

## 8.7. Group discussion and Q&A

- The results of this component should serve as guidance beyond the use of amalgam separators.
- The University of Sheffield is researching on residual amalgam waste in municipal waste sewage pipes. This problem is not well understood but, due to the history of amalgam usage worldwide and due to the heavy weight, the evidence suggests it sediments in the municipal wastewater pipes near dental practices.
- Small amounts of elemental mercury can be collected and treated the same way as dental amalgam waste.

## 9. Project component 3 session

### 9.1. Project component 3 scope: outcomes, targets, deliverables

**Presenter:** Gabriela Sardon, Consultant, Oral Health Programme, NCD Department, WHO

The third component of the project is titled 'Knowledge management and global awareness'. Through this component, the lessons learned and products developed at the national level during project components 1 and 2 will be disseminated worldwide to ensure other countries can also access this information and can replicate measures and steps to phase down the use of dental amalgam that would be suitable to their national context.

There are two outputs for this project component:

- Guidance materials updated on the future use of dental restoration materials and a global database established to inform project outputs, COP, and reporting; and
- Lesson learned are collected, systematized, and distributed by the knowledge hub through national awareness-raising campaigns and the Global Mercury Partnership.



The main target for component 3 is that at least 3 or more countries demonstrate dental amalgam phase-down efforts. There are 5 main activities that will be carried out under this component (see figure 31).

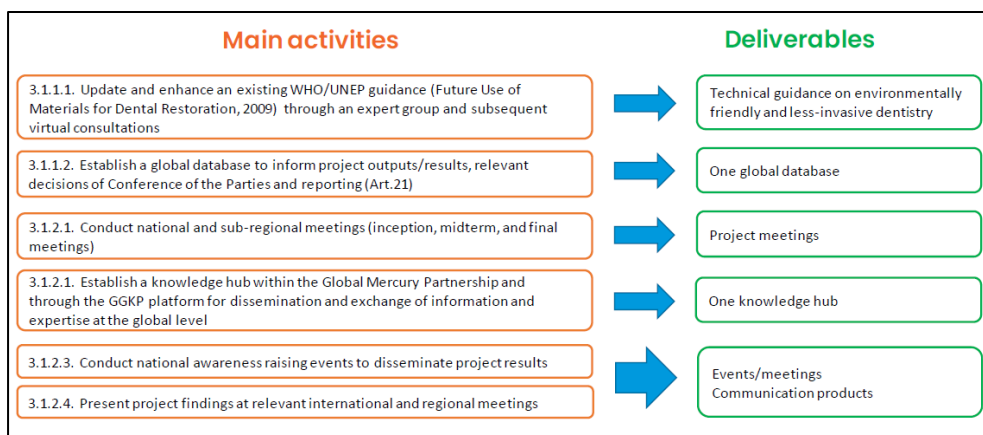


Figure 31. Project component 3 main activities and deliverables

The technical guidance on environmentally friendly and less-invasive dentistry (the first main activity of this component) will follow a number of steps (see figure 32) to support countries in the implementation of phasing down the use of dental amalgam in the context of the Minamata Convention on Mercury. It will update the content of the Future use of materials for dental restoration report,<sup>23</sup> but it will also cover additional content to address the following objectives:

- provide the most recent information and findings for the selection and use of materials for dental restoration across the full spectrum of dental caries, with a focus to promote mercury-free products and minimal intervention for the prevention and treatment of dental caries;
- share best waste management practices of materials used in oral healthcare facilities, including technical options and business models for dental waste management over the long term;
- present potential environmental issues related to quality mercury-free alternatives to dental amalgam.

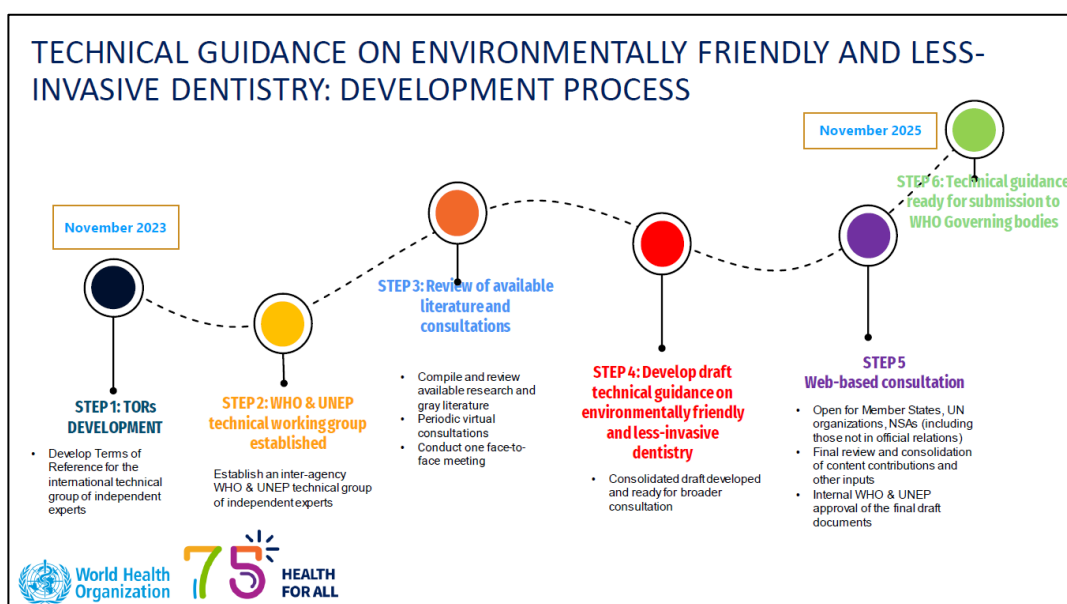


Figure 32. The development process for the technical guidance on environmentally friendly and less-invasive dentistry

<sup>23</sup> WHO. 2010. Future use of materials for dental restoration. <https://www.who.int/publications/i/item/9789241500647>

## 9.2. Knowledge hub for dissemination and exchange of information and expertise

**Presenters:** Stephanie Laurelle and Imelda Dossou Etui, Global Mercury Partnership, UNEP

The UNEP Global Mercury Partnership was established in 2005 with the overall goal to protect human health and the environment from the releases of mercury. To date, there are 8 partnership areas (see figure 33) with close to 250 partners including governments, intergovernmental organizations, non-governmental organizations, industry and private sector, academia, scientific community and others.



Figure 33. Partnership areas of the UNEP Global Mercury Partnership

The communication and outreach activities that the Global Mercury Partnership conduct include:

- Partnership Advisory Group meetings on an annual basis;
- Regular meetings of Partnership Areas;
- Webinars series in cooperation with key partners and stakeholders;
- Partnership newsletter and regular mailing; and
- Dedicated website.

The knowledge hub is planned as a platform to exchange information, provide feedback and suggest best practices for actions leverage. The following webpage was shared as an example of a knowledge hub for a different GEF-funded project on eliminating mercury skin lightening products:

<https://www.unep.org/globalmercurypartnership/our-work/mercury-products/eliminating-mercury-skin-lightening-products>. As part of the knowledge hub, the Partnership will conduct the following activities for the project:

- Knowledge generation, curation and dissemination
- Data and trends analysis
- Global communication, support in data sharing, and awareness-raising campaigns

## 9.3. Mainstreaming gender into project activities: Project gender action plan

**Presenter:** Joni Seager, Project Gender Expert Consultant, Oral Health Programme, WHO

Gender mainstreaming is a requirement by the GEF and it is also part of the commitments from WHO, UNEP and the Minamata Convention.

The Gender Action Plan being developed for the project will contribute to the success of the project through two pathways:

- The project’s strategies and activities will be more effective if they include considerations such as:
  - understanding and mitigating the ways in which mercury exposures are sex-differentiated;
  - developing awareness-raising and information programs that are designed to reach men and women equally, and that raise awareness about gender differences in exposures and management of dental amalgam; and
  - ensuring that men and women alike gain resources and benefits from this project.
- It provides guidance on achieving outcomes such as:
  - prioritizing gender balance in stakeholder constituencies and consultative processes;
  - increasing women’s participation and role in dental amalgam phase-down processes;
  - targeting both women and men as specific beneficiaries, and improving their knowledge related to mercury and dental amalgam, both as receivers (dental patients) as well as providers (dental professionals); and
  - directing technical capacity-building across the entire oral health workforce.

The gender action plan is an implementing tool by transforming equality and diversity principles into specific actions for gender-equal inclusion, access and benefits. It builds from the commitments and guidance of the GEF, UNEP and the Minamata Convention on Mercury, and it follows the structure of the project and its components to align with existing project activities and propose a few new relevant activities. Moreover, the gender action plan provides guidance on sex-disaggregated indicators and metrics to measure gender mainstreaming success or gaps.

#### 9.4. Group discussion and Q&A

- The technical guidance on environmentally friendly and less-invasive dentistry is part of the deliverable of the project and part of the mandate given by countries through the WHA Resolution 74.5 on oral health, therefore, the technical guidance will undergo a web-based consultation with Member States and Non-State actors before submission to the WHO Executive Board and World Health Assembly for adoption. It is important to also consider insurance policies and programmes during the development of the technical guidance to promote universal health coverage for oral health where relevant. Regarding the technical group of independent experts, it is suggested to invite national focal points of the Minamata Convention on Mercury. The King’s College London has the Global Collaborative for Caries Management which brings together university partners and two separate charities: ‘Alliance for a Cavity Free Future’ and ‘ICDAS Foundation’. It can provide resources regarding prevention, advocacy, policy and practice relevant to caries management.
- Becoming a partner of the Global Mercury Partnership is open to any organization in line with the overall objective of the partnership and willing to contribute through its work. Each partnership area has a business plan for implementation that is supported by its members. The Global Mercury Partnership can be used as an open platform to reach out to a broader group of stakeholders (beyond those that are partners to the project) that are experienced in phasing down the use of dental amalgam and could share technical input and key information that will support the implementation of the project. The knowledge hub could also serve as a centre for the exchange of information and resources, including relevant literature, studies, etc.
- Based on a previous experience from Uruguay with a GEF-funded project which also needed to mainstream gender issues into the project, the consultant recruited followed the UNEP’s guidance and had the following recommendations which might also be useful for this project:
  - Developing informative materials on the market to campaign about the dangers of mercury-added product for women. Indicators of this activity must include the number of informed women and the proportion of the market that has switched to safe alternatives.
  - Promoting training for women and their role in waste management and waste recycling (e.g. # women trained or working in waste management).

- It is important to communicate the project progress throughout its lifecycle, not only once project results have been achieved (towards the end of the project). Project partners will receive quarterly updates. Beyond regular communications with project partners, a communications strategy is currently being developed so that different opportunities are identified, at national, regional and global levels, to disseminate the progress and outputs achieved to broader audiences.

## 10. Closure of the meeting

Project partners, including UNEP, WHO, country delegations and co-financing partners, were supportive of the project and committed to contributing to its implementation over the next three years.

Dr Slim Slama, Head of the Noncommunicable Diseases Management-Screening, Diagnosis and Treatment unit at WHO, thanked all participants who attended in person and online for being part of this milestone in launching the project and for their close collaboration to implement national and global activities. Dr Slama reaffirmed WHO's commitment to supporting all country delegations to achieve a successful delivery of the project.



Figure 34. Global project kick-off meeting participants (in person and online)