

UPDATES IN IDENTIFICATION AND MONITORING OF MERCURY- ADDED SKIN LIGHTENING PRODUCTS



UNDER THE PROJECT: GEF 10810: ELIMINATING MERCURY SKIN LIGHTENING PRODUCTS- GABON, JAMAICA AND SRI LANKA

Mercury-added Skin Lightening Products—A Global Issue

Background

Skin lightening is a common practice worldwide and has historically been influenced by cultural and social stigmas that associate lighter skin tones with higher social status and perceived advantages—such as improved marriage prospects, better professional opportunities, and increased social status.

Mercury and its compounds are sometimes incorporated into skin-lightening products (SLPs) because they inhibit melanin production—the natural process that gives skin its pigment. By suppressing melanin production, these substances can temporarily lighten the skin, which has contributed to their use in SLPs despite well-known health risks. As a result, the use of mercury-containing SLPs has become widespread in some communities, particularly where lighter skin is associated with social or economic advantage (Eagles-Smith et al., 2018).

Mercury exposure from such products poses significant health concerns, including kidney damage, neurological effects, and skin disorders, underscoring the need for stricter regulation, public awareness, and safer alternatives.

Today, SLPs are still widely promoted for overall skin lightening and diminishing age spots and freckles. Although certain dermatological conditions, such as hyperpigmentation, may warrant the use of clinically prescribed lightening agents, these SLP formulations do not typically use mercury as an active ingredient (Hamann et al. 2014).

Under the Minamata Convention on Mercury, mercury-added SLPs are to be phased out. However, implementation of this phase-out has been challenging for many Parties, largely due to limited awareness of the presence of mercury in SLPs, as these products are often sold through informal markets and are difficult to regulate. SLPs with mercury often do not list mercury as an ingredient.

RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

Mercury—A Toxic Global Pollutant

Mercury has been listed as a top ten global pollutant by the World Health Organization (WHO) due to its highly toxic nature.

Exposure to mercury or mercury compounds through direct or indirect pathways can cause environmental problems and have serious health impacts especially amongst sensitive populations, such as pregnant women and children.

Despite these well-documented issues, mercury has been used in several applications including in the manufacture of skin lightening products.

Mercury found in cosmetics can exist in two forms: inorganic and organic (Ladizinski et al. 2011).

Organic mercury compounds such as ethylmercury, methylmercury, and phenyl mercuric salts may be used as preservatives. Trace amounts of mercury are legally added to some cosmetics, such as mascara, for its properties in preventing the growth of microorganisms.

Inorganic mercury salts including mercurous chloride (or calomel), mercuric chloride, mercurous oxide, and ammoniated mercury are added to lightening products to inhibit melanin production.



Skin lightening products are used by both men and women across the globe. The mercury in these products is harmful to the person using them as well as to non-users who come in contact with the user.

Product Ingredient Lists Can be Misleading

Both organic and inorganic forms of mercury can be hidden in the manufacturer's ingredient list (e.g., "calomel" instead of mercurous chloride) or omitted completely.

Skin lightening products may also include other highly toxic ingredients including hydroquinone, corticosteroids, and trace amounts of harmful elements (e.g., arsenic; Figure 1).

Figure 1: Potentially harmful ingredients in skin lightening products (UNEP, 2024).



MERCURY EXPOSURE FROM SKIN LIGHTENING PRODUCTS

Skin

Both **men and women** use skin lightening products.

Product is absorbed and mercury travels into the bloodstream and reaches the **kidney and liver**.

Non-users can be exposed through skin-to-skin contact with users, or through contact with clothes or bedding that was handled by the users.

Environmental pathway

Release of mercury through **wastewater discharge** can further contaminate the surrounding environment.

Inhalation

Mercury in SLP can volatilize and **mercury vapors can be detected in the ambient air** of the home.

Inhaled mercury passes through brain and placenta barriers posing a **risk for pregnant women and developing fetuses**.

Ingestion

Exposure to mercury can occur through **food** prepared by the SLP users.

Figure 2: Mercury exposure pathways from skin lightening products (UNEP, 2024).

Harmful Effects from Both Direct and Indirect Exposure

Exposure to mercury from skin lightening products can result in a number of health problems, ranging from skin irritations and allergic reactions to kidney damage and neurotoxicity. Symptoms include numbness in hands, feet and mouth, tremors, changes in vision or hearing, depression, and memory loss. Additionally, the potential maternal transfer of mercury to a fetus has implications for neurological development (Bastiansz et al. 2022).

Contamination of the Environment

In addition to human health, environmental health is also at risk. Through skin washing, mercury is eventually released into wastewater and, under certain environmental conditions, can be converted to methylmercury and absorbed into the food web exposing fish, wildlife and eventually humans to potential mercury contamination.

Under the Minamata Convention on Mercury (the global treaty aimed at protecting the environment and

human health from the negative impacts of mercury), the manufacture, import and export of cosmetics with mercury is banned by Parties to the Convention. Currently, the ban covers cosmetics with over 1 part per million (ppm) of mercury, however, as of 2025, the ban will be extended to all cosmetics with any mercury content (except for cosmetics applied to the eye area, where mercury is used as a preservative and no effective and safe substitute preservatives are available).

Due to a general lack of understanding on mercury content in skin lightening products available globally, further research is needed to assist countries in successfully implementing their obligations regarding these products.

GEF 10810 PROJECT:

ELIMINATING MERCURY SKIN LIGHTENING PRODUCTS—JAMAICA, GABON, AND SRI LANKA

A Global Campaign to Address the Issue

The Medium-Sized Project, “Eliminating Mercury Skin Lightening Products—Jamaica, Gabon, and Sri Lanka” aims to reduce the risk of exposure to mercury-added SLPs.

This multipronged project is implemented by the United Nations Environment Programme (UNEP) and co-executed by The World Health Organization (WHO) and Biodiversity Research Institute (BRI), and led nationally by each project country’s Ministry of Health in coordination with several national stakeholders.

The UNEP Global Mercury Partnership (GMP) provides technical assistance on the project overall. Funding for the project is provided by the Global Environment Facility (GEF) and several co-financing partners across governmental agencies, non-governmental organizations (NGOs), and civil society organizations (CSOs).



Skin lightening products that contain mercury are readily available at local street markets such as this one in Sri Lanka.

Project Country Background

The use of skin lightening products is widespread across the globe. To enable the engagement of each key region where skin lightening is more prevalent, Jamaica, Gabon, and Sri Lanka were engaged to provide insight into the prevalence of the issue in the Caribbean, African, and Asian regions respectively.



Jamaica—The Caribbean

In Jamaica, research has shown that SLPs have been promoted through advertisements, marketing strategies, and popular culture influencers, aimed particularly at African-Jamaican women. In 2004, it was reported that approximately 10–15% of patients seen by dermatologists locally had been using SLPs. This project aims to address the legislative, regulatory, and institutional needs to adequately manage SLPs in Jamaica as well as conduct public awareness activities.



Gabon—Africa

In Gabon, inventory assessments conducted under the Minamata Initial Assessments (MIAs) estimated that 4,385 kg of mercury per year were released due to cosmetics such as skin lightening products. The Government of Gabon has implemented several measures to address the issue of SLPs such as the development of a national strategy in 2017 by the Directorate of Medicines and Pharmacies in connection with the General Health Inspectorate to control the sale and distribution of SLPs nationally.



Sri Lanka—South Asia

Sri Lanka has 23 official local cosmetics and pharmaceutical manufacturing industries involved in the production of cosmetics and soaps. Research conducted by the Centre for Environmental Justice found high levels of mercury in many skin-whitening cream brands available in the local market in Sri Lanka. Of those assessed, 2 out of 5 locally manufactured skin whitening creams had concentrations higher than the permissible level.

Each project country is a Party to the Minamata Convention on Mercury and has begun taking active steps to implement its obligations. Preliminary assessments have indicated that the sale and use of skin lightening products is prevalent in each project country with its manufacture also confirmed in Jamaica and Sri Lanka.

Updates on Progress Made in Identification and Monitoring of Mercury-added SLPs

SLP Sample Collection Protocol

To better understand the types of SLPs present and their mercury content, a rapid sampling and analysis exercise is being conducted in each project country that will employ a 2-step sampling protocol developed by BRI.

This process includes:

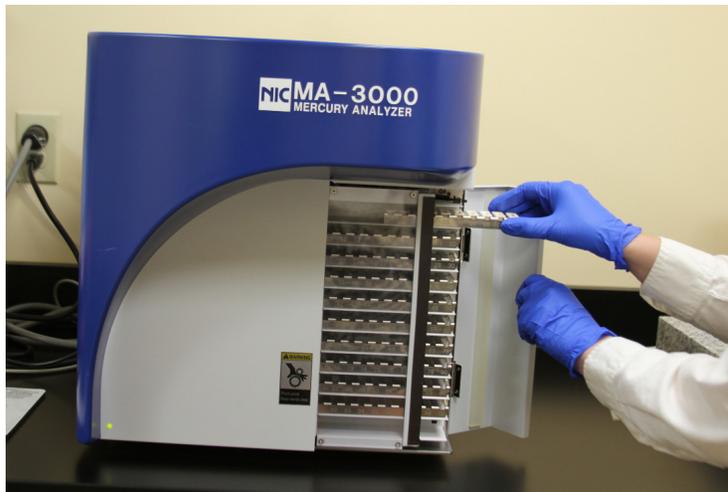
Phase 1—Purposive sampling: SLPs were purchased from formal and informal markets in each project country. Product selection was largely based on products with images and wording that indicate 'lightening,' 'brightening,' 'fairness,' 'no marks,' or other key words

Products collected were recorded with a unique sample label code and all available information from the product packaging will be logged such as:

- Name of Product
- Manufacturing Company stated
- Manufacturing Country stated
- Distributor
- Batch Number / Barcode
- Photos of product packaging

Products were sent for analysis at BRI's laboratory located in Maine, USA according to the sample testing protocol described below.

National laboratories with existing analytical capacity were also engaged to test a subset of aliquots or split samples. This supports local lab capacity building to allow for quality control and quality assurance checks as well as information exchange on protocols in place and types of equipment in use.



The Direct Mercury Analyzer is used for total mercury determination in skin-lightening products.

Phase 2—Targeted sampling: After Phase 1 sampling positively identified SLPs that contain mercury, replicates of these products are collected and analyzed to understand potential variation in mercury content across batches.

Step 1: Screening

- XRF Analyzers (X-ray fluorescence analyzers) are used to detect samples with mercury concentrations over 10 ppm.
- This is done as a screening step as higher concentrations of mercury in samples can potentially damage more sensitive mercury analyzing equipment.

Step 2: Laboratory Analysis

- A Direct Mercury Analyzer (DMA) is used to determine precise mercury concentrations in SLPs. Samples previously screened using an XRF and found to contain less than 10 ppm of mercury will be analyzed directly using the DMA. Samples with mercury concentrations exceeding 10 ppm will be diluted prior to analysis to ensure accuracy and protect the instrument.
- The limit of detection (LOD) for a DMA can be as low ~0.0001 ppm mercury, enabling highly sensitive analysis of trace mercury concentrations in samples.
- In addition to the DMA, other laboratory instruments commonly used for mercury analysis include Cold Vapor Atomic Absorption Spectroscopy, Cold Vapor Atomic Fluorescence Spectroscopy, and Inductively Coupled Plasma Mass Spectrometry. These instruments differ in sensitivity and throughput but can achieve LODs typically ranging from 0.0001-0.0005 ppm, depending on the sample type and preparation method.
- The DMA offers a reliable, relatively rapid, and low contamination for total mercury determination in liquid and solid samples without the need for chemical digestion, making it particularly suitable for SLPs.

GEF 10810 PROJECT: FINDINGS OF SAMPLING AND ANALYSIS COMPLETED (AS OF OCTOBER 2025)

Gabon

- 218 SLPs were analyzed under Phase 1.
- 2 products were identified with mercury in concentrations exceeding 20,000 ppm.

Jamaica

- 85 SLPs were analyzed under Phase 1.
- Phase 2 is pending (*final results of analysis pending*).

Sri Lanka

- 102 SLPs were analyzed under Phase 1
- 14 products were identified with mercury concentrations ranging from 965 – 30,272 ppm
- Due to the higher number of mercury-added SLPs found in Sri Lanka, sampling efforts were expanded to collect further data on products sold in-country (*final analysis is pending*).



Note: final results and an analysis of trends observed will be shared once testing of all samples collected is completed under the project.

Product name	Product description	THg (mg/kg) from XRF	Manufacture location and batch date	Image
Ujooba Beauty Cream with multivitamin Extra white magical formula:	Beauty cream with "extra white magical formula" made with multivitamins	15311	New Trend International Industries (Pvt.) Ltd., Pakistan, Lot # OT-1787, (10/2022)	
Natural Face Beauty Cream	Face cream for US protection, anti aging, and whitening	7151	"Urdu logo" Laboratories, Pakistan, Reg. No. 280669, (06/2021)	
Unlabelled cream sold in a plastic bag	vendor identified as Nadinola mixed with other unidentified products	244	N/A - Home mixture	-
Unlabelled cream sold in a plastic bag	vendor identified as Nadinola mixed with other unidentified products	202	N/A - Home mixture	-
Unlabelled cream sold in a plastic bag	white-coloured	129	N/A - Home mixture	-
Silken Bleaching Cream- non-oily, deluxe, Ammoniated Mercury 3%	Silken Bleaching Cream - non-oily, deluxe, Ammoniated Mercury 3%	9550	Jamaica, Silken, o009	
Aroma Care Pearl Glow Triple Whitening Night Cream	night cream with triple whitening properties	15353.99	S.B.C.L., Rajkot, Gujarat, India, PGPV0001 (04/2024)	
French White GOLD EDITION Perfect Radiance Intense Whitening Day & Night Cream	day and nighttime intense whitening cream with advanced whitening formula and 24K gold	2223.32	Bio International Labs, France, 14/03/2023	

Product name	Product description	THg (mg/kg) from XRF	Manufacture location and batch date	Image
Olifair Radiant Effect- Pearls-Saffron night cream	Nighttime cream with radiant effect	7069.64	N/A, N/A	
Ujooba Beauty Cream with Multivitamin. Extra White magical formula	beauty cream with multivitamin and extra white magical formula	30272	New Trend International Industries (Pvt) Ltd., Pakistan, B.NV-1931, (11/2023)	
Kanza Beauty Cream	face cream to remove dark circles, acne, wrinkles, and freckles. With additional UV protection	21816	N/A, N/A	
Fresh & White Beauty Cream	beauty cream for fairer skin and dark spot reduction with UV protection and blemish removal	21509.86	Pakistan, Life Cosmetics, (01/2024), barcode# 7896325147987	
French White Perfect Radiance Intense Whitening Day & Night Cream	intense whitening day and night cream with advanced formula with whitening beads made with papaya extract and containing vitamin e	1330	Bio International Labs, France, 3322 (20/02/2023)	
French White GOLD EDITION Perfect Radiance Intense Whitening Day & Night Cream	Intense whitening day and night cream with advanced whitening formula and 24K gold	1157	Bio International Labs, France, 3322 (14/03/2023)	
Diamond Herbal Whitening Lotion	Whitening lotion to clear scars, sunburns, scratches. with sandalwood, aloe, vitamin c, ginseng.	2318	Diamond Luxury Cosmetics (Pvt) Ltd, Sri Lanka, #1280, (07/2023)	
Diamond Night cream	night cream to clear wrinkles, diminish marks. Containing vitamin c, hibiscus, aloe very, sandalwood, ginseng, and kojic.	13721	Diamond Luxury Cosmetics (Pvt) Ltd, Egypt, 1280, (03/2024)	
Olifair Professional Ultra Glow Day Serum	Daily serum made with kojic acid, alpha arbutin 2%, glutathione. SPF 30,	965	Jovin Cosmetics. India, C-016, (08/2023)	
Gorgeous Fairness Night cream	Night cream to whiten the skin, strengthen skin regeneration. Treats pimples, dark eye circles, wrinkles.	3096	Magic of Herbs, India, L08/044, (01/2024)	
AQEE Face Cream	Face cream for all skin types made with carrot and pomegranate	7551	N/A, N/A	
Skin Bright gold beauty cream	lightening beauty cream made with 24k gold	26314.27	Pakistan, "Skincare Company", B22001, (02/2022)	
Goree Beauty Cream with lycopene	Goree white radiance night beauty cream for whitening and nourishing. With vitamin B3, avocado, and aloe vera	22287	Goree Cosmetics (Pvt.) Ltd., Pakistan, GB142, (08/2023)	

Mercury-added SLPs—Database Development

A database of results from this project will be shared via **UNEP’s Global Mercury Partnership website** by March 2026.

In addition to the sampling data collected under the project, BRI has gathered and is comparing existing validated data globally from over 50 published journal articles, databases and reports released by recognized entities (NGOs and monitoring agencies) such as the Zero Mercury Working Group.

Data is being incorporated to identify trends in mercury-added SLP trade and distribution that will be made available to assist government agencies (such as Customs, Consumer Affairs, Bureaus of Standards etc.) in identifying and monitoring sale and trade of SLPs.

Enhancing National Capacities for Identification and Monitoring of SLPs

National Laboratory Capacity Building

Existing national laboratories have been engaged to analyze aliquots (split samples) taken. This enhances the quality assurance/quality control of results obtained and enables the building of laboratory capacity through information sharing on lessons learned and best practices for skin lightening product analysis.

Guidance on best practices/lessons learned from analysis of Hg SLPs using different analytical equipment is under development.

Customs Capacity Building

Customs training tools are under development for project countries. To date, a training workshop has been completed for Sri Lanka in collaboration with the Asian Institute of Technology and the World Customs Organization, which highlighted the needs to build country-specific enforcement capacity, improve coordination between national agencies and cross-border to close enforcement gaps, train officers in forensic detection and risk assessment for mercury shipments.

Key priorities of this training also included strengthening technical knowledge of international regulations, emphasizing the importance of initiating a national action plan for mercury trade control, and gathering up-to-date mercury trade data to better understand national challenges. Lessons learnt will be shared by March 2026.



Ashley Bastiansz, BRI’s International Environmental Specialist, visits the Sri Lanka Standards Institute to provide hands-on training with the Direct Mercury Analyzer.



Workshop participants from the customs training in Sri Lanka in July 2025.

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For more information and updates on all project activities, scan the QR code or visit: www.unep.org/mercuryfreecosmetics



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