



World Health
Organization

MERCURY IN SKIN LIGHTENING PRODUCTS

Mercury is a common but dangerous ingredient found in skin lightening creams and soaps. Beauty standards promoted by media, advertising and marketing reinforce the bias that lighter skin tone is more desirable than darker skin tone. Skin lightening creams and soaps are commonly used in many African, Asian and Caribbean nations (1, 2). They are also used among dark-skinned populations in Europe and North America (3–5). Mercury salts inhibit the formation of melanin, resulting in a lighter skin tone (6, 7). The Minamata Convention on Mercury establishes a limit of 1 mg/kg (1 ppm) for skin lightening products (8), yet many cosmetic products contain mercury levels higher than that amount to

increase whitening effect (9, 10). Despite having been banned in many countries, mercury-containing products are often easily obtainable (11).

Mercury can be eliminated from skin lightening products by working with health and environmental ministries and raising public awareness about the dangers to health from mercury and other hazardous chemicals in skin lightening products. To stop the manufacture, import and export of skin lightening products in line with the Minamata Convention, regulatory actions by governments are needed – including training of customs agents – as well as major media and advocacy campaigns.

Use, production and availability

- Skin lightening products are used worldwide, but their use is particularly widespread in many African, Asian and Caribbean countries (1, 12). Skin lightening products are used by both women and men (13).
- The skin lightening industry is one of the fastest growing beauty industries worldwide and is estimated to be worth US\$ 31.2 billion by 2024 (14). In India, for example, the skin lightening industry (including products with and without mercury) represents 50% of the skincare market and is estimated to be worth US\$ 450–535 million (14).
- Mercury-containing skin lightening products are manufactured in many countries and areas, including Bangladesh (15), China (16, 17), Dominican Republic (18), Hong Kong SAR (China) (15), Jamaica (15), Lebanon (19), Malaysia (15), Mexico (17, 20), Pakistan (21), Philippines (22), Republic of Korea (15), Thailand (23, 24), and the United States of America (25).
- Mercury-containing skin lightening products are available for sale over the Internet, promoted online on social media sites, and sold through mobile apps. According to the United States Food and Drug Administration (FDA), these products are often manufactured abroad and sold illegally in the United States, often in small shops and informal markets catering to Latino, Asian, African or Middle Eastern communities. Consumers also purchase them in other countries and bring them back to their country (26). The toxic trade of often illegal mercury-added skin lightening products is a global crisis expected to only worsen with skyrocketing demand, especially in Africa, Asia and the Middle East (15).
- A 2011 survey funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety noted that individuals from Brazil, Kyrgyzstan, Mexico and the Russian Federation believe that mercury-containing skin lightening products are easy to obtain (11).

- A study conducted by the Zero Mercury Group in 2017 and 2018 collected 338 samples of skin lightening creams from 22 countries in both formal and informal markets to identify a “snapshot” of the frequency and concentrations where mercury is used as an active ingredient in skin lightening creams worldwide. Thirty-four creams (10% of the samples) were found to have high mercury levels, i.e. above 1 ppm. These high mercury samples were found in seven of the 22 countries. Of these seven countries, four had requirements prohibiting more than 1 ppm mercury content. Overall, the mercury concentrations in these particular products ranged from 93 ppm to over 16 000 ppm (15). Other studies have found even higher concentrations of mercury in skin lightening products (27).
- Since 2010, the California Department of Public Health’s Environmental Health Investigations Branch (EHIB) has conducted investigations of poisonings involving mercury in blemish and spot-removing face cream products. They have found a variety of mercury-containing products from Cambodia, China, Japan, Mexico, Pakistan and the Philippines. The EHIB determined that some of the products caused serious health problems, including health problems that required hospitalization (28).
- Many countries have enacted legislation banning mercury-containing cosmetics, but many others have not. Despite legislation prohibiting mercury-containing products, their availability remains a problem (29). Even where distribution is banned, mercury-containing products are often still easily obtainable (11).
- Skin lightening products that do not contain mercury may contain other hazardous substances, such as hydroquinone. In places where skin lightening products are used, consumers may be unaware of the harmful effects of the chemicals in these products (30).

Products, packaging and ingredients

- Skin lightening products come in different forms, including creams and soaps. The soap may be sold as “antiseptic soap” (3). These products are supposed to be applied to the skin to dry overnight (3). Both women and men use the soap to wash their hair, arms, face or entire body (3). It is reported that some individuals have used these products for decades (1).
- The soaps, which are sold in stores and online, come in bar form and are sold individually in boxes (4). The creams are generally packaged in tubes or jars (4). The soaps contain approximately 1–3% mercury iodide and the creams are composed of 1–10% mercury ammonium (3). Some soap products that have been tested contained mercury at concentrations up to 31 mg/kg (31 ppm), whereas some cream products have been found to have mercury concentrations as high as 33 000 mg/kg (33 000 ppm) (27). The Minamata Convention establishes a limit of 1 mg/kg (1 ppm) for skin lightening products, yet many cosmetic products contain mercury levels higher than 1 mg/kg (1 ppm) to increase whitening effect (9, 10).
- The amount or concentration of mercury in a product may be labelled on the packaging or listed in the ingredients list. Names to look for include: mercury, Hg, mercuric iodide, mercury oxide, mercurous chloride, ethyl mercury, phenyl mercuric salts, ammoniated mercury, amide chloride of mercury, mercury iodide, or “poison”. Directions to avoid contact with silver, gold, rubber, aluminium and jewellery may also indicate the presence of mercury (3, 4, 26, 31–33). Of great concern is that companies selling products containing mercury do not always list it as an ingredient.

Other cosmetics containing mercury

- Mercury may also be found in cosmetics for the eye area, such as mascara, and in eye makeup cleansing products, where it is used as a preservative (1, 3, 31).
- Mercury in cosmetics exists in two forms: inorganic and organic (31, 34, 35). Inorganic mercury is used in skin lightening creams and soaps. Organic mercury compounds (e.g. thiomersal, which contains ethyl mercury, and phenyl mercuric salts) are used as cosmetic preservatives in eye makeup, including mascara, and in eye makeup cleansing products (3, 31–33). These forms of mercury differ in their degree of toxicity, and have varying effects on the nervous, digestive and immune systems, as well as the lungs, kidneys, skin and eyes (36).
- The Minamata Convention does not establish a limit for eye area cosmetics where mercury is used as a preservative, and no effective and safe substitutes are available (8).

Health effects

- Adverse health effects of the inorganic mercury contained in skin lightening creams and soaps include: kidney damage (7), skin rashes, skin discolouration and scarring, reduction in the skin's resistance to bacterial and fungal infections (31), anxiety, depression, psychosis and peripheral neuropathy (3, 31).
- The medical literature reports specific instances of individuals suffering from the aforementioned health effects following exposure to mercury through skin lightening creams and soaps. One case report describes a 34-year-old Chinese woman who developed nephrotic syndrome, a condition marked by high levels of protein in the urine. Nephrotic syndrome can be associated with a series of complications that affect an individual's health and quality of life. The mercury levels in the woman's blood and urine returned to normal one month and nine months, respectively, after she stopped using the skin lightening cream (37). Another case report describes a 54-year-old woman with an onset of dementia, epilepsy and peripheral polyneuropathy at the age of 49. After six years of daily skin lightening cream application, exposure was stopped immediately, after which her blood and urine mercury levels returned to unexposed levels (38).
- One study revealed a large proportion of nephrotic syndrome among African women using ammoniated mercuric chloride-containing skin lightening creams for periods ranging from one month to three years. After cessation of mercury-containing skin lightening creams, urine mercury levels rapidly fell to within the unexposed range. Over three quarters of the women who stopped using the creams went into remission (7, 39).
- Mercury in soaps, creams and other cosmetic products is eventually discharged into waste water. The mercury then enters the environment, where it becomes methylated and can enter the food chain as highly toxic methylmercury in fish (3). Pregnant women who consume fish containing methylmercury can transfer the mercury to their fetuses, which can result in neurodevelopmental deficits in the children (3).
- Exposure to inorganic mercury can be quantified through measurements in blood and urine (34).

Regulations

- The Minamata Convention on Mercury is a global treaty "to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds" (8). It entered into force on 16 August 2017 and as of November 2019, 114 countries had ratified the Convention. After 2020, Parties to the Convention are required to have banned the manufacture, import and export of "Cosmetics (with mercury content above 1 ppm), including skin lightening soaps and creams, and not including eye area cosmetics where mercury is used as a preservative and no effective and safe substitute preservatives are available" except where the Party has registered an exemption to 2025 (8, 40). As of November 2019, a number of Parties had registered such an exemption (8, 41). The intention of the Convention is not to cover cosmetics, soaps or creams with trace contaminants of mercury (8).
- The European Union (42, 43) and many other countries have regulations banning mercury-containing cosmetics. These include Canada (44), Philippines (24) and the United States (45), as well as a number of African nations (11), including Ghana, Nigeria and Uganda (12).

Actions needed

- To protect the public from negative health effects of mercury in skin lightening products, actions are needed that engage different parts of society, such as, but not limited to:
 - establishing or improving legislation;
 - implementing compliance and enforcement strategies for legislation, including training for customs agents and identification of manufacturers and supply chains;
 - strengthening laboratory capacity to test for mercury in skin lightening products;
 - conducting advocacy campaigns run by national health authorities, and public awareness campaigns to inform consumers about the health risks of skin lightening products, including those containing mercury; and
 - increasing awareness among health professionals of health risks associated with skin lightening products, including those containing mercury, to inform and educate patients and the community.

Conclusions

- Mercury-containing skin lightening products are hazardous to health and as a result have been banned in many countries. Even in some countries where such products have been banned, they are still advertised and available to consumers via the Internet and other means.
- There is a great need for public awareness given the worldwide increase in the use of cosmetic products containing mercury.
- Information on the hazards of skin lightening products in general must be provided to consumers as even skin lightening products that do not contain mercury may contain other hazardous substances, such as hydroquinone.

For further WHO information on mercury, please visit:
<https://www.who.int/health-topics/chemical-safety>

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