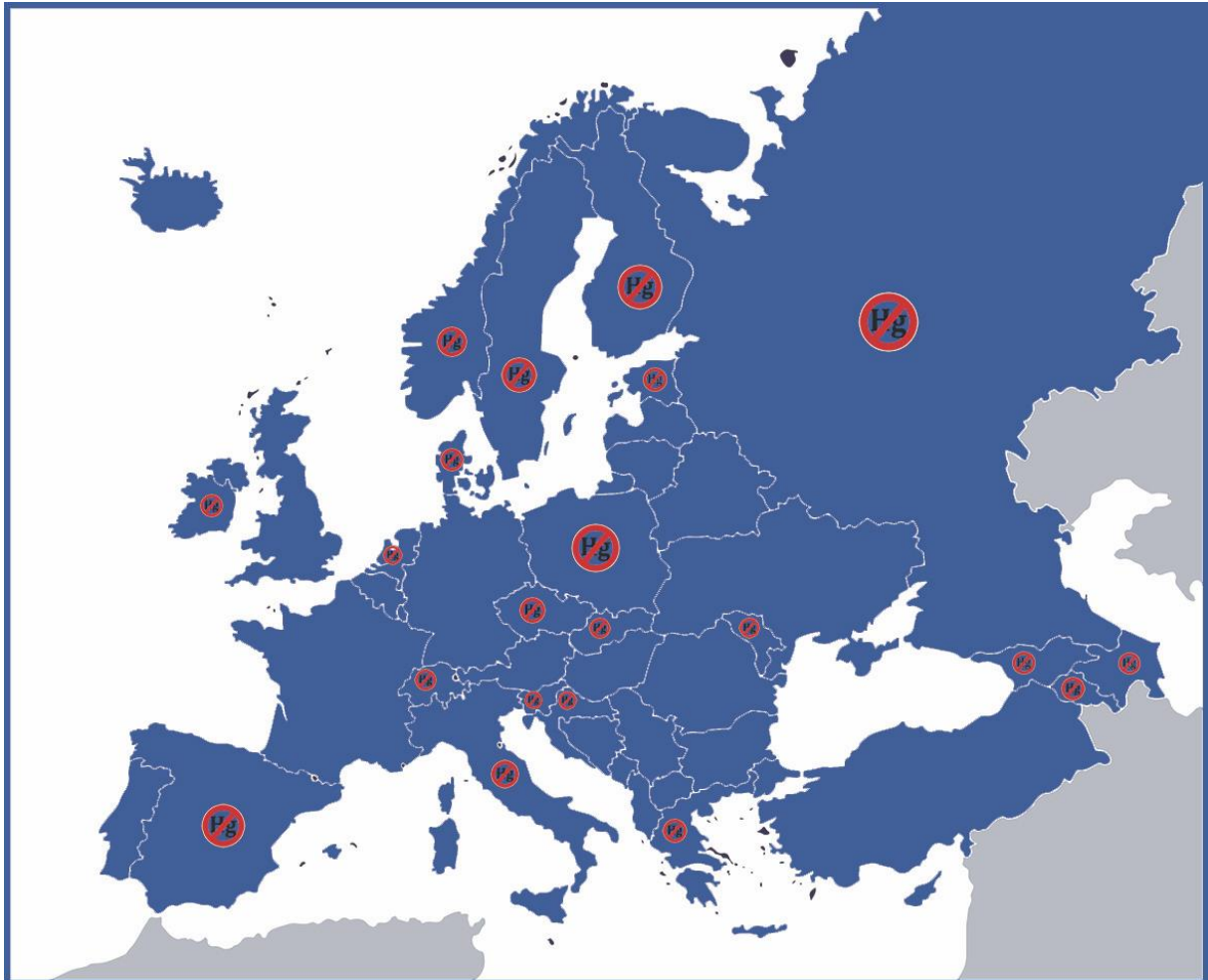


European Plans to Reduce and Eliminate Dental Amalgam Use



by

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August 2022



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1. Executive summary

1.1. Mercury

Mercury and its compounds pose a risk to the environment and human health due to their toxicity. Major sources of human exposure and contamination of soil and water include the use of mercury in dentistry and other products, in industrial processes and in the artisanal processing of gold ores, as well as mercury emissions from coal-fired power plants and other sources. This report focuses on the mandated reduction of dental amalgam use in European countries.

1.2. Dental amalgam

Dental amalgam is a dental filling material made by combining elemental mercury (about 50% of the amalgam) with a variety of metals (silver, tin, copper, etc.). Despite regulatory and other precautions, mercury from dentistry is inevitably released to the environment. When emitted to the atmosphere, mercury may be transported locally, regionally and globally, and is subsequently deposited in the Earth's oceans, lakes, streams, soils, etc. When mercury is deposited into these media, microbial metabolism transforms a portion of it into methylmercury, one of its most toxic forms, which may then be taken up in the food chain.¹

Many nations have severely restricted or banned the use of dental amalgam, while others have eliminated its use in women during their childbearing years, as well as children. Among other important initiatives, the European Union instituted a mid-2018 ban on amalgam use in children, pregnant women, and breastfeeding women, required Member States in 2019 to develop strategies to reduce amalgam use,² and in June 2020 the European Commission received a consultant report regarding the phase-out of all amalgam use in the EU.

1.3. Releases of mercury to the environment

Even though a precise measurement of mercury releases from dental use is problematic, the health and environmental risks cannot be ignored. Mercury from dental amalgam is released to the environment (air, water and soil) mainly through wastewater, waste disposal, leakages from dental surgeries, cremations and burials.

With regard to potential health effects, the exposure of the general population to mercury occurs mainly due to mercury accumulated in fish and through inhalation (organic mercury, methylmercury), as well as due to direct exposure to dental amalgam (elemental mercury, inorganic mercury). In addition, mercury is released from natural deterioration of amalgam fillings (chewing, brushing, etc.). Dental personnel and patients with amalgam fillings are two groups with higher measured exposure levels.³

Two aspects of dental mercury make it uniquely toxic to humans and the environment. First, because the mercury is carried out of the dental clinic in people's teeth, no effective environmental containment is possible. Amalgam separators may catch much of the mercury

¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3514464/>

² https://ec.europa.eu/environment/chemicals/mercury/regulation_en.htm

³ Ibid., p.15

left behind in the clinic; but the mercury that leaves the clinic will enter the environment sooner or later. Second, because mercury is by far the most volatile of the heavy metals – the only one remaining liquid at room temperature – amalgam is an occupational hazard for dental workers. Unless every dental clinic employee, patient and visitor is protected, they will be exposed to this neurotoxin at the clinic. Because amalgam is no longer necessary for dental care, dental workers and their patients are subjected to an absolutely unnecessary exposure to mercury which may lead to miscarriages or lifetime kidney, neurological, or other permanent health disabilities.

1.4. Economic impacts of dental mercury releases

The value to the economy and society of phasing out the use of amalgam has already been demonstrated by a number of studies.

In particular, a study conducted for the European Commission by BIO Intelligence Service concluded that, when all environmental and socio-economic aspects are considered, phasing-out the use of dental amalgam is one of the most effective options for protecting human health and the environment.⁴

And, the extensive Deloitte assessment of the feasibility of phasing-out dental amalgam recently carried out for DG Environment of the European Commission concluded that “a general phase-out is both technically and economically feasible.”⁵

1.5. Health concerns for vulnerable populations

Amalgam fillings are unavoidably a source of direct exposure to mercury. Mercury vapor is released especially during the placement of new fillings or the removal of old ones, but also during the ongoing use and deterioration of amalgam fillings in people’s mouths.

Mercury exposure from amalgam fillings poses an increased health risk especially to a certain percentage of susceptible individuals, and/or those with other health problems such as kidney disease, and/or those exposed to a mix of other pollutants. These factors together comprise a significant percentage of the population.

How much mercury vapor is released over time depends on the number of fillings, the skill of the dentist, the filling size and placement, the surface, composition and age of the amalgam restorations. The emission of mercury vapor may also temporarily increase when brushing, when grinding the teeth, when drinking hot beverages, or as a result of chewing habits or the food texture. Adverse health effects may also depend on the nose-mouth breathing ratio, inhalation, ingestion, body weight and the reduced ability of many individuals to excrete mercury as part of the natural process.

Mercury vapors are primarily absorbed by the body through inhalation to the lungs. The average body eliminates some of the absorbed mercury, but small amounts distributed through the bloodstream may collect in certain tissues, including the brain and kidneys, or in the case of pregnant women, in the blood going to the fetus through the umbilical cord.

⁴ BIO Intelligence Service (2012), Study on the potential for reducing mercury pollution from dental amalgam and batteries; http://ec.europa.eu/environment/chemicals/mercury/pdf/review_mercury_strategy2010.pdf

⁵ Deloitte et al., Assessment of the feasibility of phasing-out dental amalgam, report prepared under contract to the Directorate-General Environment of the European Commission, 17 June 2020.

In 2019, the US Food and Drug Administration (FDA) published the most recent systematic literature review (2010-present) analyzing the Epidemiological Evidence on the Adverse Health Effects Reported in Relation to Mercury from Dental Amalgam.⁶

Key among the findings were the uncertainties about the acceptable reference exposure levels for mercury vapor, the potential for mercury to convert to other mercury compounds in the body, and whether the degree of accumulation of mercury from dental amalgam results in negative (adverse) health outcomes, particularly when added to mercury exposures from other environmental and/or dietary sources (e.g., fish).

Subsequently the FDA issued in September 2020 a Recommendations for Certain High-Risk Groups Regarding Mercury-Containing Dental Amalgam, with the following statement:⁷

As a precaution, the FDA recommends the use of mercury-free alternatives such as composite or glass ionomer cement fillings for Children, especially under 6 years of age, pregnant and nursing women, women who wish to have children, patients with neurological diseases such as multiple sclerosis, Alzheimer's or Parkinson's disease, patients with impaired kidney function and persons with allergies to mercury or other components of amalgam.

The last EU-Opinion on the safety of dental amalgam and alternative dental restoration materials for patients (SCENIHR, 2015⁸) confirmed that mercury vapor is released from silver amalgam restorations under numerous circumstances and cited a lack of knowledge and a need for further research, in particular in regard to genetic susceptibility related to mercury effects.

1.6. Minimally invasive and mercury-free dentistry

Recent decades of research into mercury-free restoration materials have resulted in products superior to amalgam in tooth friendliness, in preventing cavities, in preserving tooth structure, and in longevity.

Mercury-free restoration techniques are less invasive and some filling materials even react with the tooth tissue to form new, permanent tissue with a composition close to the original one. Such techniques leave more intact tooth tissue in the treated tooth, while dental amalgam placement tends to weaken the overall tooth structure (due to the significant amount of healthy tooth tissue that has to be removed). Such “minimally invasive techniques” tend to prolong the life of the tooth before implants (expensive) and/or extraction may be necessary.

⁶ Epidemiological Evidence on the Adverse Health Effects Reported in Relation to Mercury from Dental Amalgam: Systematic Literature Review (2010-Present) (Published September 2019), <https://www.fda.gov/media/131151/download>

⁷ Recommendations About the Use of Dental Amalgam in Certain High-Risk Populations: FDA Safety Communication, September 24, 2020, <https://www.fda.gov/news-events/press-announcements/fda-issues-recommendations-certain-high-risk-groups-regarding-mercury-containing-dental-amalgam>

⁸ SCENIHR, 2015. Scientific opinion on the Safety of Dental Amalgam and Alternative Dental Restoration Materials for Patients and Users https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_046.pdf

Mercury-free filling materials such as composite resin and glass ionomer adhere to the remaining tooth tissue, relying on chemical bonding with tooth dentine and/or enamel for retention, unlike dental amalgam restorations, which depend on mechanical retention from the converged cavity walls.

The mercury-free adhesive technique allows the practitioner to perform a restoration that is exclusively related to the size of the defect and not subject to the requirements of the filling material. Less need for preparation results in less weakening of the tooth. Adhesive fillings are particularly indicated in the case of extensive cavities, in order to avoid tooth fractures.⁹

An *in vivo* study showed that when primary caries lesions in the occlusal surfaces of first molars were restored with amalgam, the surface occupied by the restoration was five times larger than when a composite resin was used. This means that a composite restoration can be replaced several times, if necessary, before the same amount of tooth material as with amalgam is lost. However, when composite resin restorations fail in the long term, there is no need to replace them completely as they can generally be repaired.¹⁰

In Europe, the use of tooth-colored mercury-free materials for the treatment of incisors is already common practice, and most caries in the posterior region can be treated with durable single-layer restoration materials as well.

Glass ionomer cements (GIC), compomers and especially bulk fill composites are perfectly adequate for a functional restoration, and also meet the technical and economic requirements with regard to their durability (abrasion resistance) and dimensional stability (minimal shrinkage).¹¹

Glass ionomer cement has several properties that are favorable for all patients, including its chemical bonding and release of fluoride, its biocompatibility, its capability for thermal expansion similar to tooth structure, and its low moisture sensitivity.

In a recent WHO report,¹² WHO supports minimally invasive techniques in order to avoid unnecessary pain, infection and permanent damage to teeth while preventing and treating caries. Minimally invasive techniques also generate few or no aerosols, which is particularly beneficial when there is concern about possible airborne transmission of illness, such as during the COVID-19 pandemic.

1.7. Minamata Convention

The Minamata Convention on Mercury was negotiated under the auspices of the United Nations Environment Programme, and is an international treaty with the overall objective to protect

⁹ Die Verwendung von Amalgam- und Kompositrestaurationen zur direkten Versorgung von Seitenzahnkavitäten in Deutschland und deren Qualität, Mathias Igelbrink, 2016 <https://d-nb.info/1104749076/34>

¹⁰ JJM Roeters, ACC Shortall, and NJM Opdam, Can a single composite resin serve all purposes?, *British Dental Journal*, 73 - 79 (2005), <http://www.nature.com/bdj/journal/v199/n2/full/4812520a.html>

¹¹ Finding a political solution for phasing out dental amalgam in Germany, August 2020, https://environmentalmedicine.eu/wp-content/uploads/Phasing-out-amalgam_IGUzMCEW_20Aug2020.pdf

¹² Prevention and treatment of dental caries with mercury-free products and minimal intervention: WHO oral health briefing note series. Geneva: World Health Organization; 2022. <https://apps.who.int/iris/bitstream/handle/10665/352480/9789240046184-eng.pdf?sequence=1&isAllowed=y>

human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The agreement became binding under international law on 18 May 2017, when at least 50 states (including EU Member States) had ratified it, and it entered into force on 16 August 2017. The Minamata Convention has now been signed by nearly every nation, and it has been ratified by nearly 140 countries. The European Union has played a leadership role from the start of negotiations, and there is every reason to believe that this leadership will continue with regard to dental amalgam.

One of the main focuses of the Minamata Convention is to reduce the use of mercury in products and manufacturing processes. The Convention also includes measures to control the supply and trade of mercury, including restrictions on specific sources of mercury such as primary mining. Among other provisions, the Convention provides for financial and technical support to developing countries and countries with economies in transition.¹³

Under the Minamata Convention Article 4(3) (in conjunction with Annex A, part II), the Parties to the Convention must take measures to phase down the use of dental amalgam, including two or more of the measures from the following list:

- (i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration;
- (ii) Setting national objectives aiming at minimizing its use;
- (iii) Promoting the use of cost-effective and clinically effective mercury-free alternatives for dental restoration;
- (iv) Promoting research and development of quality mercury-free materials for dental restoration;
- (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;
- (vi) Discouraging insurance policies and programs that favour dental amalgam use over mercury-free dental restoration;
- (vii) Encouraging insurance policies and programs that favour the use of quality alternatives to dental amalgam for dental restoration;
- (viii) Restricting the use of dental amalgam to its encapsulated form;
- (ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land.

On 25 March 2022, two additional binding measures were adopted at the fourth Conference of the Parties (COP-4) of the Minamata Convention.¹⁴ Parties are now also obliged to:

- (i) Exclude or not allow, by taking measures as appropriate, the use of mercury in bulk form by dental practitioners;
- (ii) Exclude or not allow, by taking measures as appropriate, or recommend against the use

¹³ <http://mercuryconvention.org/Portals/11/documents/Booklets/COP1%20version/Minamata-Convention-booklet-eng-full.pdf>

¹⁴ UNEP / MC / COP. 4 / 28/Add.1 - Report of the Conference of the Parties to the Minamata Convention on Mercury on the work of its fourth meeting - In-person segment (Advance), 08 April 2022, https://www.mercuryconvention.org/sites/default/files/documents/final_report/K2201138%20-%20UNEP-MC-COP.4-28-Add.1-%20ADVANCE.pdf

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.

Similar language is found in the EU Mercury Regulation, which has led the way to end amalgam use in children and many young women worldwide.

1.8. The EU Mercury Regulation

For the European Union, the Minamata Convention was integrated into European law via Regulation 2017/852 (the EU Mercury Regulation),¹⁵ which stipulates *inter alia* for all EU Member States:

- From 1 January 2019 dental amalgam was to be used only in pre-dosed encapsulated form.
- From 1 January 2019 dental facilities were required to use and properly maintain amalgam separators in order to capture and remove from the wastewater system amalgam and teeth containing amalgam. Separators installed after 1 January 2018 needed to provide a retention level of at least 95%, and from 1 January 2021 all other separators needed also to provide this retention level.
- Dentists must ensure that amalgam waste is managed by authorized waste management organizations.

In addition, the European Parliament and the Member States introduced some measures that went beyond those of the Convention:

- It introduced a ban (with some exceptions) on the use of dental amalgam in children under 15 years and pregnant or breastfeeding women from 1 July 2018.
- It required the Member States to lay down the rules on penalties applicable to infringements of this Regulation and take all measures necessary to ensure that they were implemented. The penalties provided for needed to be effective, proportionate and dissuasive.
- It required the Member States to designate the competent authorities responsible for carrying out obligations arising from this Regulation.
- Each Member State was required by 1 July 2019 to produce a national plan detailing the measures it intended to implement to phase down the use of dental amalgam.
- The Commission was required to assess and report on the feasibility of a phase-out of the use of dental amalgam in the long term, and preferably by 2030, taking into account the national plans required by 1 July 2019, and whilst fully respecting Member States' competence for the organisation and delivery of health services and medical care.

1.9. Revision of the EU Mercury Regulation

Since the use of mercury in dental amalgam is the largest use of mercury in the European Union, and a significant source of mercury pollution, the Commission was mandated to assess and

¹⁵ https://ec.europa.eu/environment/chemicals/mercury/regulation_en.htm

report by July 2020 on the feasibility of a phase out of the use of dental amalgam in the long term and preferably by 2030, and if appropriate, present a legislative proposal.

The Commission contracted a consultant and the extensive Deloitte assessment released in June 2020 concluded that “a general phase-out is both technically and economically feasible.”¹⁶ Therefore, the Commission subsequently announced to the Parliament and Council that a legislative proposal to phase out amalgam would be presented by the end of 2022.

The European Commission subsequently commissioned another study to support the assessment of impacts of the revision of the Mercury Regulation (EU) 2017/852 and conducted public consultations on the “Have your say” portal. The consultants are also conducting targeted stakeholder and expert consultations and are to report back by August 2022.

The Commission's surveys and studies consider phase-out date scenarios of 2025, 2027, and 2030.

So as not to hinder and possibly reduce the effectiveness of other European legislation and policies, a timely phase-out of amalgam use is indicated for the following reasons, among others:

- The transitional period of the Medical Devices Regulation ends on 25 May 2024, posing a challenge for the approval of amalgam capsules. The legal safety requirements are more significant than previously, and could hinder the availability of amalgam capsules;¹⁷
- The EU Water Framework Directive, which classifies mercury as a priority hazardous substance, requires that waters in the EU should be in "good ecological" and "good chemical status" no later than 2027;¹⁸
- The EU Water Reuse Regulation aims to reduce water scarcity for agricultural irrigation from 2023 as a result of climate change, and to guarantee a high level of protection for the environment and human and animal health with minimum requirements;¹⁹
- The EU Circular Economy Action Plan calls for a review of the Wastewater Treatment and Sewage Sludge Directives to apply circular economy practices to the management of wastewater and sewage sludge;²⁰
- Alternative mercury-free dental filling materials are reliable, cost-effective, and available, as evidenced by the growing number of EU Member States that have phased down or completely phased out dental amalgam use;
- Alternative materials are already used far more often than amalgam, which has been banned in the EU since July 2018 for children and pregnant and breastfeeding women;
- The human health and environmental risks associated with dental amalgam considerably outweigh any risks associated with alternative filling materials;
- Surveys have confirmed strong public support in favour of a European ban on amalgam.

¹⁶ Deloitte et al., Assessment of the feasibility of phasing-out dental amalgam, report prepared under contract to the Directorate-General Environment of the European Commission, 17 June 2020.

¹⁷ Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices

¹⁸ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy,

¹⁹ Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse

²⁰ https://ec.europa.eu/environment/pdf/circular-economy/new_circular_economy_action_plan.pdf

1.10. Purpose of this document

The purpose of this document is to provide an overview of national measures to reduce the use of amalgam fillings in Europe. Our systematic review of the national plans shows how the use of dental amalgam can generally be replaced by the use of alternatives under a wide variety of conditions.

It is expected that this document will be of particular interest to the Consultants to the European Commission as they develop an incentive impact assessment for the preparation of a legislative proposal to phase out dental amalgam in Europe. It is also anticipated that this analysis will be of use to other Parties to the Minamata Convention as they develop their own strategies for phasing out amalgam use.

1.11. Basic findings

The requirements of the EU Mercury Regulation to phase out the use of dental amalgam in children under 15 years of age, pregnant and breastfeeding women (as of 1 July 2018), and the call for National Action Plans (NAPs) to further reduce the use of amalgam (as of 1 July 2019) provided the impetus for the transition to mercury-free dentistry in Europe.

Countries with full or at least partial reimbursement for dental fillings needed to identify alternatives to dental amalgam for the treatment of vulnerable populations. This has led to a re-evaluation of effective, available and affordable alternatives.

Germany, the **Czech Republic** and **Slovenia** decided to reimburse composites at 100% instead of dental amalgam. **Austria** went for glass ionomer cements and **Poland** decided to directly replace the reimbursement of dental amalgam with the full reimbursement of three types of glass ionomer cements for the entire population.

The Eu requirement to draft National Action Plans to phase out the use of dental amalgam preferably by 2030 has further encouraged the transition to mercury-free dentistry in the European Union, and sent a signal to other European countries and the World. National Action Plans published within the EU by May 2022 include the following:

- Ten Member States went for a general phase-out: **Croatia**, the **Czech Republic**, **Finland**, **Greece**, **Ireland**, **Italy**, the **Netherlands**, **Slovakia**, **Slovenia** and **Spain**. **Sweden** ended amalgam use a decade ago. **Estonia**, with amalgam use already at only 1%, is assessing the feasibility of a full phaseout. **Poland** is withdrawing mercury fillings from the guaranteed benefits, effectively phasing out dental amalgam in 2022.
- Having long ago banned amalgam in the primary teeth, **Denmark** prohibited its use in permanent teeth except under four limited exceptions – so now amalgam use is under 2%. **Lithuania** is following the Danish example and restricts the use to exceptional cases.
- **Ireland**, **Slovakia**, **Czech Republic**, **Croatia**, **Slovenia** and **Hungary** will alter their insurance schemes to favor mercury-free fillings in the coming years.
- In **Finland**, a composite restoration already costs the patient the same as an amalgam restoration.
- **Croatia** and **Cyprus** are gradually expanding the phase out of amalgam use for children by raising the minimum age for amalgam to 18, and **Slovenia** to 25.
- **Romania** and **Spain** permit the use of dental amalgam only in a selected list of medical clinics.

- **Cyprus, Czech Republic, the Netherlands, Portugal and Spain** allow amalgam only in case of demonstrated medical need.
- **Portugal, Romania** and the **Czech Republic** require informed consent to use amalgam.
- **Lithuania, Latvia** and the **Netherlands** ended the teaching of amalgam restorations in their dental schools, effectively ending amalgam as the new generation of dentists take over.
- **Austria, Italy** and **Germany** have expanded health protection by recommending not to use amalgam for those with kidney disease, and **Austria** has included also those with certain neurological conditions. **Lithuania** prohibits amalgam use for patients with metallic denture frameworks that could interact with amalgam. **France** and **Italy** recommend to avoid the placement of amalgam in direct or indirect contact with precious metal alloys, gold-plated brass anchors or other metallic restorations, and strongly discourage the whitening of teeth with amalgam fillings.
- **Estonia, Lithuania, Latvia, Greece, Cyprus** and **Germany** have submitted interim plans (first assessing actual amalgam use) to reduce amalgam use, and will present their long-term plans in the near future.

Most European non-EU Countries have already significantly reduced the use of dental amalgam:

- **Norway** (in 2008), **New Caledonia** (France, in 2019) and the **Republic of Moldova** (in 2020) have generally phased out dental amalgam without any exceptions.
- **Armenia, Azerbaijan, Georgia, Kazakhstan** and **Russia** declared that they use no mercury fillings at all.
- As dental amalgam has not been allowed for children in the Soviet Union since 1982 and hardly used at all, its use never gained significance in **Belarus, Kyrgyzstan, Turkmenistan, Ukraine** and **Uzbekistan**.
- **Switzerland** and **Liechtenstein** prohibit the use of dental amalgam in cases where a mercury-free alternative can be used. The use has declined to less than 1% of all fillings placed.
- **Albania, Iceland** and the **UK** have also agreed to phase out amalgam use for children under the age of 15, pregnant and breastfeeding women.

A recently published WHO survey has revealed that two-thirds of European countries will have phased out the use of dental amalgam by 2025.²¹

The health risks of amalgam, the precautions required for its use, the manufacturers' withdrawal from the EU Market, and the expensive environmental impact, clearly argue against the continued use of dental amalgam, while the benefits and availability of minimally invasive dentistry and the many examples of countries where amalgam has successfully been replaced by alternatives are showing the economic feasibility of a timely transition.

Discussions about ending amalgam use have gone on in the EU for many years. The general phase out of dental amalgam was already recommended by European Commission advisors in

²¹ Report of the Informal Global WHO consultation with policymakers in dental public health, 2021. Monitoring country progress in phasing down the use of dental amalgam. Geneva: World Health Organization; 2021

2012, and the European Parliament's Committee on the Environment voted in October 2016 to end the use of dental amalgam by 31 December 2022.²²

For every new amalgam filling that is placed, mercury is released to the environment. This must be stopped as it will prolong the significant environmental burden represented by the many tons of mercury already in people's mouths.

2. Quantifying the actual use of dental mercury

Dental amalgam is the largest remaining use of mercury in the EU.

The EU Feasibility Study 2020 estimated the annual demand for dental amalgam at the EU28 level (including the UK) between 26.8 t and 58.3 t Hg/year in 2018. The share of dental amalgam restorations as a percentage of all restorations was estimated to be between 10% and 19%.

However, these data are based on estimations and assumptions. Reliable information on the exact use of amalgam is lacking.

Only in very few Member States dentists are required to report the use of amalgam, such as in **Belgium** and **Germany** (since 2021)²³ when invoicing statutory health insurers. In these cases the statistics on the use of amalgam is only meaningful because the public health insurance covers a significant part of the population – in Belgium 99%, in Germany 90% of the population.

The share of amalgam used by dentists who charge patients **privately** or through private health insurers is difficult to identify as there is usually no reporting requirement.

Only **Lithuania** required by 1 May 2021 all personal health care institutions providing dental services to inform the Institute of Hygiene about the number of dental amalgams consumed and the number of teeth extracted that have been filled with dental amalgams for the previous calendar year (from 1 January to 31 December) once a year (by 28 February).²⁴

In other countries data on amalgam use may still be based on surveys of dentists or market analysis. Import-export statistics could provide insight into the actual use of amalgam but current codes for dental amalgam (HS Codes) are not adequate to provide useful statistics.

²² Report on the proposal for a regulation of the European Parliament and of the Council on mercury, and repealing Regulation (EC) No 1102/2008, 20. October 2016, https://www.europarl.europa.eu/doceo/document/A-8-2016-0313_EN.html

²³ 21. Änderungsvereinbarung zum BMV-Z, 26 October 2020, https://www.ig-umwelt-zahnmedizin.de/wp-content/uploads/21_AEnderungsvereinbarung_BMV_Z.pdf

²⁴ Įsakymas Dėl Dantų amalgamų naudojimo tvarkos aprašą patvirtinimo, Ministry of Health of the Republic of Lithuania, 25 January 2021 <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/200f5b925f4d11eb9954cfa9b9131808>

The EUDAMED medical devices database, established under the European Commission's Medical Devices Regulation (MDR), could provide an overview of dental amalgam market authorizations once it is fully operational in 2022.²⁵

However, since the Medical Devices Regulation came into force in May 2020, it has been observed that numerous manufacturers are withdrawing from the amalgam business in Europe. The increased safety requirements are posing a serious challenge to the certification of dental amalgam as a medical device.

The number of market approvals for dental amalgam is likely to continue to decline over the next few years and the market may even dry up by May 26, 2024, when the transition period for the MDR will expire.²⁶

Another method of tracking amalgam use is to monitor the mercury-containing waste generated. However, it is difficult to draw accurate conclusions about actual amalgam use as most of the waste in Europe is nowadays generated during the removal of amalgam.²⁷

As the use of amalgam in the EU clearly declines every year, it shows that most dentists are already skilled in the use of alternatives and prepared for the general transition to mercury-free dentistry.

3. Restrictive measures

3.1. Modify or strengthen legislation and regulation

Countries wishing to phase down or phase out amalgam use may consider adapting their legislation to both set an objective and to achieve it.

In the Soviet Union, the use of dental amalgam was prohibited for children already in **1982**²⁸. Thereafter, amalgam was hardly used at all. Today dental amalgam is completely phased out in **Russia**²⁹, **Kazakhstan**³⁰, **Armenia**³¹, **Azerbaijan**³², **Georgia**³³ and **Moldova**³⁴, while in other former Soviet Union Members like **Ukraine**, **Belarus**, **Kyrgyzstan**, **Uzbekistan** and **Turkmenistan** the use of amalgam has never gained significance.

²⁵ The product nomenclature for dental amalgam is Q010101, dental preservative amalgams.

²⁶ Survey by the European Center for Environmental Medicine (Feb 2022), <https://environmentalmedicine.eu/manufacturers-exiting-the-amalgam-business-in-europe/>

²⁷ Approximately 30% of mercury is wasted during the restoration process.

²⁸ Minamata Convention Initial Assessment Report, Republic of Moldova, 2017

²⁹ Report of the Informal Global WHO consultation with policymakers in dental public health, 2021. Monitoring country progress in phasing down the use of dental amalgam. Geneva: World Health Organization; 2021

³⁰ Report on second level mercury inventory in the Republic of Kazakhstan, 2019

³¹ Minamata Convention Initial Assessment Report, Armenia, 2019

³² Minamata Convention Initial Assessment Report, Azerbaijan, 2018

³³ Minamata Convention Initial Assessment Report, Georgia, 2017

³⁴ Minamata Convention Initial Assessment Report, Republic of Moldova, 2017

During the 1980s, concerns about the use of amalgam also arose in **Sweden** and **Norway**, where the process to end the use started with a recommendation against the use of amalgam for vulnerable populations such as children and pregnant women.

The first regulatory step in **Sweden** was taken in 1999, with the decision of the parliament to end the financial support for amalgam fillings in the public insurance system. The general ban (with a few exemptions) followed in 2009 for environmental reasons. These exemptions were ceased in 2018.

Norway introduced a general ban on a wide range of mercury added products in 2008, with an exemption period – expired in 2011 – for the use of dental amalgam in special cases.

Denmark prohibited the import, sale and export of dental amalgam, except for fillings in permanent molars, where the filling is worn by January 1995³⁵. The exceptions were further specified by the Public Health Authority in 2006³⁶. The consequence is that the use has dropped to 1% compared to alternative fillings by 2018.

Based on these experiences, the **European Union** decided in 2017 that from July 2018, dental amalgam should no longer be used for dental treatment of deciduous teeth, of children under 15 years and of pregnant or breastfeeding women, except when deemed strictly necessary by the dental practitioner based on the specific medical needs of the patient.

By July 2019, each member state had to present a national plan with measures to further reduce the use of dental amalgam. Subsequently, eleven countries have set themselves the goal of generally phasing out the use of amalgam, and some have directly enacted legislation to this end.

Slovakia, incorporated in July 2018 the decision of its National Plan into the Act on Health Care Providers, Health Care Workers and Professional Health Organizations.³⁷ From January 2031 it will no longer be allowed to use dental amalgam in dental practices and dental emergency services.

Lithuania announced in its 2018 National Plan to establish the legal preconditions for monitoring and controlling the use of dental amalgam. In January 2021, the Ordinance on the Procedure for the use of Dental Amalgam³⁸ was adopted stipulating that amalgam should no longer be used except for very limited cases (see [3.4.](#)).

As a non-EU country, **Switzerland** amended in 2015 its Ordinance on Risk Reduction (ChemRRV)³⁹ to prohibit the use of dental amalgam in cases where mercury-free alternatives

³⁵ Bekendtgørelse nr 520 af 09/06/1994 om forbud mod salg af kviksølv og kviksølvholdige produkter

³⁶ Udfasning af amalgam i tandplejen – afklaring af muligheder og anbefalinger, Sundhedsstyrelsen 2006.

³⁷ Act no. 578/2004 Coll § 79 paragraph 1 letter ax) on Health Care Providers, Health Care Workers, Professional Health Organizations and on Amendments to Certain Acts, amended on 01.07.2018

³⁸ Įsakymas Dėl Dantų amalgamų naudojimo tvarkos aprašą patvirtinimo, entering into force on 1 may 2021

³⁹ Chemikalien-Risikoreduktions-Verordnung, ChemRRV of 18 May 2005, <https://environmentalmedicine.eu/wp-content/uploads/ChemRRV-2005.pdf>

can be preferred for medical reasons. In 2018 Switzerland further made the decision to end the export of mercury for use in dental amalgam capsules by 31 December 2027.⁴⁰

This ordinance also applies in **Liechtenstein** based on the Customs Union Treaty.⁴¹

Moldova enacted the Chemicals Law on 29 November 2018, prohibiting the use of amalgam from 15 February 2020 without any exceptions⁴² and **New Caledonia** (France) declared on 16 September 2019 to no longer allow the use of amalgam fillings based on the definition of their National Medical Devices Regulation.⁴³

The UK (by July 2018), **Iceland** (by July 2019) and **Albania** (by July 2021) decided to align with the Regulation of the EU and prohibit the use of dental amalgams for the dental treatment of deciduous teeth, children under the age of 15 and pregnant and breastfeeding women. (The **UK** decided to transfer the Mercury Regulation (EU)2017/852 into national law after Brexit,⁴⁴ **Iceland** amended their Chemicals Act⁴⁵ and **Albania** passed a mercury ordinance⁴⁶ in June 2019.)

3.2. Penalties

For the effective implementation of regulations, punitive measures should be established in case of non-compliance. Penalties for misuse of mercury in dentistry may be found in various regulations such as Health Care Provider Acts, Public Health Regulations, Chemical Laws or Environmental Protection Acts. The European Mercury Regulation (EU) 2017/852 explicitly requires penalties that are effective, proportionate and dissuasive.⁴⁷

By August 2021, 15 EU member states had notified the European Commission about their sanctions for the misuse of amalgam procedures in dental clinics without separators, as well as for the misuse in children, pregnant and breastfeeding women.⁴⁸

In **Sweden, Finland and Denmark** dentists risk a fine or imprisonment for up to two years. In **Germany and Bulgaria**, the fines are up to 50.000 €, in **Austria** up to 40.000 € (in case of

⁴⁰ The export deadline may be extended depending on the demand of mercury for use in dental amalgam in the Parties to the Minamata Convention, the measures taken by the Parties to reduce the release of mercury from the use of dental amalgam, and the status of implementation of the phase-out of dental amalgam in the European Union.

⁴¹ First full national report of the Minamata Convention on Mercury 2021 https://www.mercuryconvention.org/sites/default/files/documents/national_report/Report_Liechtenstein_2021.English.pdf

⁴² Lege Nr. 277 din 29.11.2018 privind substanțele chimice, https://environmentalmedicine.eu/wp-content/uploads/Republic-Moldova_EN.pdf

⁴³ Arrêté de l'Haut-Commissariat de la République en Nouvelle-Calédonie, 16 September 2019, <https://environmentalmedicine.eu/wp-content/uploads/New-Caledonia-Phase-Out-2019.pdf>

⁴⁴ The Control of Mercury (Amendment) (EU Exit) Regulations 2018, <https://www.gov.uk/eu-withdrawal-act-2018-statutory-instruments/the-control-of-mercury-amendment-eu-exit-regulations-2018>

⁴⁵ Lög um breytingu á efnalögum, nr. 61/2013, með síðari breytingum, 11 June 2019, https://environmentalmedicine.eu/wp-content/uploads/1790_Law_2019.pdf

⁴⁶ Vendim Nr. 442, datë 26.6.2019, <https://turizmi.gov.al/wp-content/uploads/2019/07/vkm-442-2019-per-ndalimin-e-eksportit-te-merkurit.pdf>

⁴⁷ Article 16

⁴⁸ https://www.asktheeu.org/en/request/article_16_of_regulation_eu_2017?

repetition), in the **Czech Republic** up to 7.800 €, in **Slovakia** up to 3.319 €, in **Romania** up to 1.600 €, in **Latvia** up to 1.400 € and in **Lithuania** up to 600 €. ⁴⁹

Italy adopted specific penalties in October 2021 and imposed fines of 10.000 to 100.000 € on dentists who use dental amalgam in violation of the EU regulation. ⁵⁰

3.3. Alter the public insurance scheme in favor of mercury-free fillings

In most European countries, dental amalgam is no longer used in private dental clinics, but continues to be offered to the low-income population in public health systems. Some countries therefore started to switch to alternative materials in the public health services, or at least offer alternatives under the same conditions as dental amalgam.

The demand for standard services from public health insurers might increase when effective and esthetic materials are reimbursed and could lead to fewer private extra payments for dentists. Therefore, both the health insurance companies and the dentists are affected by a changeover.

But alternative filling materials are more tooth- and environmentally friendly, are nowadays effective, without elevated material costs and being a challenge for dentistry, which makes the transition to mercury-free dentistry inevitable.

Sweden already stopped subsidizing amalgam in 1999, so the cost to patients for amalgam became comparable to the cost of **composite, glass ionomer or compomer**. ⁵¹

Poland decided in February 2022 to withdraw dental amalgam from public health care benefits without any transition period and reimburse instead the treatment of cavities with: ⁵²

- **glass ionomer cements,**
- **high density glass ionomer cements** and
- **resin-reinforced glass ionomer cements.**

⁴⁹ A list with quotes and references can be found on the website: <https://environmentalmedicine.eu/eu-mercury-regulation-penalties-for-dentists-misusing-dental-amalgam/>

⁵⁰ Atto del Governo 249. Disciplina sanzionatoria per la violazione delle disposizioni divcui al regolamento (UE) 2017/852 sul mercurio, http://documenti.camera.it/leg18/dossier/pdf/Am0123.pdf?_1654600495458

⁵¹ In Sweden dental health care is free until the age of 23. From the age of 24, patients have to pay for fillings out of their own pocket, but receive a state subsidy of 300 Skr. to 600 Skr. (30 - 60 €) per year, which can be saved up for to 2 years. When the cost of dental care treatment reaches a total of 3.000 Skr. (300 €) during a period of twelve consecutive months, patients have to pay only 50% of costs exceeding that amount. If costs exceed 15.000 Crowns (1500 €), patients pay only 15% of the cost. The cost for a filling of **composite, glass ionomer or compomer** ranges in Sweden between 60 € and 150 €.

⁵² Draft amendment of the regulation on guaranteed benefits in the field of dental treatment, 17 February 2022, https://environmentalmedicine.eu/wp-content/uploads/NAP_23022021.pdf

The decision to phase out dental amalgam was supported by the Polish dental association.⁵³

Slovakia announced at the COP-4 of the Minamata Convention to reimburse glass ionomer cements for permanent fillings for the general population, with only a small price difference compared to dental amalgam in 2022.⁵⁴

Slovenia announced in the national plan to further gradually replace the reimbursement for amalgam with the reimbursement for composites:

- by 2025 **in adolescents and young adults aged 16 to 25**
- by 2027 for the use **in premolars** (molars Nr. 4+5) in the general population
- by 2030 for the use in the general population

In **Slovenia** the public health care system covers dental fillings for children, adolescents and students by 100% and for adults by 80%.

Ireland, Croatia, Hungary and the **Czech Republic** have also announced to generally replace reimbursements for dental amalgam in the statutory health insurance. In **Hungary** and the **Czech Republic**, composites are the preferred alternative.

In **Finland**, there are no more policies or programs that would favor dental amalgam use over mercury-free dental restoration, a composite restoration costs the patient the same as an amalgam restoration.

In the **Czech Republic**, it should be possible to have uniform reimbursements for dental fillings regardless of the material by 1 January 2025. In **Croatia**, the replacement of reimbursements for dental amalgam is targeted for 31 December 2025 at the latest.

Austria introduced the reimbursement of **glass ionomer cements** in their statutory health insurance schemes for children up to 15 years of age, pregnant women and breastfeeding women.⁵⁵

In **Germany** and **Slovenia** **composite** fillings are fully reimbursed for children up to the age of 15, pregnant and breastfeeding women. And the **German armed forces** fully reimburse **composite** fillings for the military as part of the unpaid troop medical care (utV).⁵⁶

3.4. Allow amalgam only in exceptional cases

Norway and **Sweden** continued to allow the use of amalgam in exceptional cases for a few years before it was completely banned (**Norway** in 2011, **Sweden** in 2018). In **Sweden**,

⁵³ Statement of the Presidium of the Supreme Medical Council (NRL) <https://nil.org.pl/dla-lekarzy/dla-stomatologow/kontrakty/5991-amalgamat-wypada-z-koszyka> The Polish Agency for Health Technology Assessment and Tariff System (AOTMiT) has announced to revise corresponding positions by July 2022. In Poland, 31% of dentists are under contract with the National Health Fund (Analiza Rynku Stomatologicznego. Available online: <https://analizarynku.eu/rynek-stomatologiczny>, accessed on 24 May 2022)

⁵⁴ According to a statement by the Ministry of Environment.

⁵⁵ Rundschreiben neue Vertragsleistungen, Österreichische Zahnärztekammer, 19 June 2018, https://www.zahnaerztekammer.at/fileadmin/content/shared/infocenter/amtliche_mitteilungen/Gesamtvertragliche_Vereinbarungen/AEnderungen_per_1._Juli_2018/Rundschreiben_neue_Vertragsleistungen_190618.pdf

⁵⁶ Statement by the Kommando Sanitätsdienst der Bundeswehr, 3 September 2021

amalgam was used only in isolated cases in the years before the exemptions were withdrawn, indicating that the use was no longer necessary even in complicated cases.

In the **Republic of Moldova** (2020) and **New Caledonia** (2019), the use of amalgam was directly banned without any exceptions. In **Slovakia** dental amalgam will be banned by January 2031 without any exception and **Russia, Kazakhstan, Armenia, Azerbaijan** and **Georgia** have declared not to use mercury fillings at all.

In **Europe** dental amalgam is not used for the treatment of incisors, since minimal invasive alternatives are easier to apply and covered by public health insurance. Some countries are only allowing the use of dental amalgam for molars in exceptional cases.

Denmark saw the use of amalgam decline to 1% of all fillings by 2018, as it (since 2006) had restricted the use of amalgam to exceptional cases where the use of alternatives was considered to be challenging for dentists. Some exceptional cases included:⁵⁷

- lack of possibility of drying
- difficult accessibility of the cavity
- especially large cavity
- large distance to neighboring tooth

In **Lithuania (since 2021)**, the use of amalgam may no longer be used for small fillings and not for patients with metallic denture frameworks that could interact with amalgam. The exceptions are:⁵⁸

- for the restoration of defects in the masticatory surfaces of molars (**Class I, II**)
- medium to large dental cavities (**at least 2 mm deep**)
- when it is not possible to restore the tooth with an alternative filling due to difficulties in controlling the moisture or the accessibility of the cavity

In **Switzerland**, the use of dental amalgam was restricted in 2015 to cases where a mercury-free alternative is preferred for medical reasons, which corresponds to the exemptions introduced by the **EU Mercury Regulation** for dental treatment of deciduous teeth, of children under 15 years and of pregnant or breastfeeding women in 2017:

- *except when deemed strictly necessary by the dental practitioner based on the specific medical needs of the patient (like patients who prove to be allergic to certain alternative materials).*

In **Spain, Portugal, Cyprus**, the **Czech Republic** and the **Netherlands**, corresponding regulations are to be introduced for the general population. **Portugal, Romania** and the **Czech Republic** will require informed consent to the use of dental amalgam from the patients.

3.5. Allow amalgam only in centralized clinics

⁵⁷ Udfasning af amalgam i tandplejen - afklaring af muligheder og anbefalinger, Sundhedsstyrelsen, June 2006, https://www.sst.dk/-/media/Udgivelser/2006/Publ2006/KOT/Amalgam/Amalgam_udfasning,-d-.pdf.ashx

⁵⁸ Įsakymas Dėl Dantų amalgamų naudojimo tvarkos aprašą patvirtinimo, Ministry of Health of the Republic of Lithuania, 25 January 2021 <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/200f5b925f4d11eb9954cfa9b9131808>

Since 2019 all EU dental facilities dealing with dental amalgam (use of amalgam and/or removing dental amalgam fillings) are required to be equipped with amalgam separators ensuring the retention and collection of amalgam particles preventing their release into wastewater systems. Since 2021, all separators must have a minimum retention level of 95%.

As the purchase of an amalgam separator represents a considerable investment for a dentist, some countries have given dental facilities the choice of whether to purchase a separator or not to deal with amalgam any longer.

Romania announced to draw up a register with dental clinics that continue to deal with dental amalgam and approve the separators. For the removal of dental amalgam in the case of dental emergencies, specialized emergency clinics should likewise be equipped with separators and registered.

Poland is phasing out the use of amalgam and only requires those dental practices to be equipped with separators which offer to remove amalgam fillings. To compensate for the purchase of separators, Poland is introducing a reimbursement for the removal of amalgam fillings from the statutory health insurance funds.⁵⁹

Spain announced to establish a register with exclusive health centers authorized to place, remodel or extract dental amalgam fillings.

4. Non-restrictive measures

All parties to the Minamata Convention on Mercury have committed to reduce the use of dental amalgam. In Europe the introduction of the phase-out of amalgam for children up to 15 years of age and for pregnant and breastfeeding women has significantly raised public awareness of the need to abandon this environmental toxin in dentistry.

However, there is still need to educate dentists and patients. Several EU member-states like **Luxembourg, Bulgaria** or **Greece** have announced campaigns to inform dentists and the public about the health effects of mercury and the role that reducing the use of dental amalgam plays in limiting mercury releases.

4.1. End the teaching of amalgam placement in dental schools

Several countries have ended the practical teaching of amalgam at the university so as to protect students and teachers from mercury exposures in classrooms and to foster the transition to mercury-free, minimally invasive dentistry, as the use of amalgam will end when the new generation of dentists takes over.

⁵⁹ Draft amendment of the regulation on guaranteed benefits in the field of dental treatment, 17 February 2022, <https://environmentalmedicine.eu/wp-content/uploads/dokument544752.pdf>

In the **Netherlands** dental faculties have stopped teaching students to use dental amalgam since 1997, in **Lithuania** students have not been trained in dental amalgams since 2008 and also in **Latvia** there is no more training in the use of amalgam.⁶⁰

4.2. Recommendations for the (non-)use of dental amalgam

In some European countries recommendations against the use of dental amalgam are in place that go beyond the regulations of the EU Mercury Regulation.

For patient safety, for example, **amalgam should not be used** in Austria⁶¹, France⁶², Germany⁶³ and Italy⁶⁴ if there is **evidence of allergy** to any of the components or in patients with **severe renal insufficiency**. In Austria the use is further not indicated in patients with **progressive degenerative diseases of the peripheral or central nervous system**.⁶⁵ In Austria and Germany, statutory health insurers reimburse the use of alternatives in these cases.

In Germany and Austria, amalgams may **not be used for retrograde root fillings, as material for stump abutments under crowns or bridges and as sealing material for cast crowns**.

In Italy and France, dental amalgam **should not be used next to precious metal alloys, gold-plated brass anchors or other metal restorations** to avoid corrosion risks. In Lithuania the use is **prohibited for patients with metallic denture frameworks** that could interact with amalgam.

In France it is strongly **discouraged to perform whitening on teeth filled with amalgam**. The presence of localized lichenoid lesions in direct contact with amalgam fillings may warrant removal of otherwise satisfactory fillings.

Germany recommends for the placing and removing of dental amalgam:⁶⁶

- Ready-mixed amalgam should be placed in the cavity in portions and condensed with sufficient pressure. Ultrasonic condensers should not be used.
- Place an appropriate pulp protection under the amalgam filling.

⁶⁰ Informatīvais ziņojums "Par Zobārstniecības amalgamas lietošanas pakāpeniskas samazināšanas plāna 2019.-2020.gadam ietekmes izvērtējumu", 15 June 2021 https://tapportals.mk.gov.lv/legal_acts/5ce73c0c-474e-4c13-8daf-9cc0a9ec7aa4

⁶¹ ÖNAP-Dentalamalgam 2019, https://environmentalmedicine.eu/wp-content/uploads/O%CC%88NAP-Dentalamalgam_2019.pdf

⁶² L'Agence Nationale de Sécurité du Médicament et des produits de santé (ANSM), Recommandations à respecter lors de l'utilisation des amalgames dentaires, December 2014, <https://ansm.sante.fr/uploads/2021/03/11/7cacb0593aa9f8ebd9b176c65ff98890.pdf>

⁶³ Bundesinstitut für Arzneimittel und Medizinprodukte, Amalgame in der zahnärztlichen Therapie, 2005, https://environmentalmedicine.eu/wp-content/uploads/BfaRM_Amalgame_2005.pdf

⁶⁴ Ministero della Salute, Decreto 10 Ottobre 2001, <https://www.gazzettaufficiale.it/eli/gu/2001/11/09/261/sg/pdf>

⁶⁵ According to homepage BMASGK - "Notes on dental amalgam for use on patients 2019".

https://www.sozialministerium.at/dam/jcr:94a51758-e55d-44bb-9661-7a1cac273698/Hinweise_zu_Dentalamalgam_f%C3%BCr_die_Anwendung_an_Patienten_2019.docx.

⁶⁶ Bundesinstitut für Arzneimittel und Medizinprodukte, Amalgame in der zahnärztlichen Therapie, 2005, https://environmentalmedicine.eu/wp-content/uploads/BfaRM_Amalgame_2005.pdf

- If the alloy contains more than 0.01% zinc, the ingress of moisture during mixing and condensation can lead to increased expansion and corrosion of the filling, which should be avoided.
- Amalgam fillings should be polished, as this leads to a reduction of the surface and subsequently reduces corrosion. Polishing should be performed after 24 hours at the earliest, when the amalgam filling has hardened.
- When removing amalgam, the evaporation of mercury should be avoided, suitable instruments should be used and the largest possible filling fragments should be removed with low contact pressure.

The **Greek** Dental Association recommends for the removal of dental amalgam to increase the safety of the patients:⁶⁷

- Maintain low temperature throughout the removal.
- Continuously irrigate the surface of the material and the tooth.
- Use a strong suction in direct contact with the surgical field.
- Use diamonds or special metal cutters for less particle dispersion. Conventional carbide engravers should be avoided.
- Cut the amalgam block into large fragments and remove the pieces with a hand tool.
- Use a rubber dam for intraoral collection of amalgam particles.
- Use protective glasses and optionally use a special protective cap for the hair.
- Recommend preventive consumption of sulfur-containing foods before and after removal of amalgam restorations. Sulfur-containing foods include garlic, apple juice, animal protein, cashews, vitamins C, A, E complexes, tocopherols, L-cysteine, and selenium (chelating agents).

Greece⁶⁸ and **Italy**⁶⁹ recommend for the dental staff:

- Store amalgam capsules in a cool, ventilated environment.
- Work in ventilated rooms with non-textile coverings.
- Avoid handling amalgam capsules with bare hands.
- Carefully clean contaminated tools before sterilization.
- Use of apron, mask, glasses and plastic mask, gloves and shoes with flat sole.
- Practice personal hygiene (daily change of work clothes, etc.).
- Avoid taking food / liquid in the dental clinic.

4.3. Prevention

Several countries like **Belgium**, **Bulgaria** or **Luxembourg** committed in their National Action Plan to promote caries prevention in order to reduce the overall use of amalgam, even though this measure is not technically promoting the transition to mercury-free dentistry.

⁶⁷ Οδοντιατρικό Αμάλγαμα: Επιβίωση υπό όρους απόσυρση, 27 February 2019, [https://www.odoskor.gr/index.php/eggrafa/entypa-
eoo?task=callelement&format=raw&item_id=15&element=f85c494b-2b32-4109-b8c1-
083cca2b7db6&method=download&args\[0\]=07ebb46dbf1e72d965edaf55077dd8f9](https://www.odoskor.gr/index.php/eggrafa/entypa-
eoo?task=callelement&format=raw&item_id=15&element=f85c494b-2b32-4109-b8c1-
083cca2b7db6&method=download&args[0]=07ebb46dbf1e72d965edaf55077dd8f9)

⁶⁸ Ibid.

⁶⁹ Ministero della Salute, Divieto di utilizzazione, importazione e immissione in commercio, sul territorio italiano degli amalgami dentali non preparati sotto forma di capsule predosate e precauzioni ed avvertenze da riferire nelle istruzioni per l'uso degli amalgami dentali posti in commercio in Italia. 10 ottobre 2001, <http://dentalbios.it/web/app/uploads/2016/07/2-AMALGAME-Decreto-2001-Ministro-Sirchia-1.pdf>

5. National measures (Country by Country)

5.1. European Union

The use of dental amalgam indicated in the following list is compared to alternative filling materials with reference to:

- 1) BIO Intelligence Service (2012), Study on the potential for reducing mercury pollution from dental amalgam and batteries, Final report prepared for the European Commission – DG ENV ⁷⁰ and
- 2) Deloitte et al., Assessment of the feasibility of phasing-out dental amalgam, report prepared under contract to the Directorate-General Environment of the European Commission, 17 June 2020 ⁷¹

1. Sweden

current use of amalgam: **0%**

Swedish National Plan to Phase Out Dental Amalgam, March 2019: ⁷²

- Sweden stopped to subsidize dental amalgam in 1999
- **In 2009 dental Amalgam was banned** with following exceptions:
 - 1) Technical difficulties in the placement of alternative materials
 - 2) Adverse reactions to alternative materials
 - 3) In restorations done under general anaesthesia in Specific medical condition
- Sweden **ceased the exemptions in 2018** as they were only applied to very few individual cases

2. Denmark

use of amalgam: **5% in 2010 / 1% in 2018**

Danish legislation and actions in connection with the phasing out of dental amalgam, 29 January 2019: ⁷³

- By 1 January 1995 **Denmark** prohibited the import, sale and export of dental amalgam, except for fillings in permanent molars, where the filling is worn.
- The exception was specified by the Public Health Authority in 2006 and allowed the use of dental amalgam **only in the following cases**:
 - 1) lack of possibility of drying
 - 2) difficult accessibility of the cavity
 - 3) especially large cavity
 - 4) large distance to neighboring tooth

⁷⁰ https://ec.europa.eu/environment/chemicals/mercury/pdf/mercury_dental_report.pdf

⁷¹ <https://environmentalmedicine.eu/wp-content/uploads/Dental-Amalgam-feasibility-study-Final-Report-1.pdf>

⁷² <https://environmentalmedicine.eu/wp-content/uploads/pm-3-19-national-plan-of-dental-amalgam-phase-out.pdf>

⁷³ <https://environmentalmedicine.eu/wp-content/uploads/DK-plan.pdf>

3. Italy

use of amalgam: **1% in 2010 / 2,2% in 2018**

Piano nazionale per l'eliminazione dell'utilizzo dell'amalgama dentale, 23 February 2021: ⁷⁴

- Italy has presented a National Plan which describes the actions necessary to achieve the gradual phasing down of the use of dental amalgam in dentistry, with the ultimate goal of achieving complete elimination of its use (**phase out**), through non-mandatory measures, **by 31 December 2024**.

Decreto **n°.261** Ministero della Salute, 10 October 2001: ⁷⁵

Following information should be included in the instructions for use of amalgams placed on the market in Italy:

- store amalgam capsules in a cool, ventilated environment;
- work in ventilated rooms with decontaminable non-textile coverings;
- always carry out under cooling, suction and isolation of the operating field, milling and polishing of amalgam;
- do not place dental amalgam in the vicinity of other metal restorations in order to avoid corrosion risks;
- in case of supervening local reactions, especially lichenoid lesions in the vicinity of an amalgam, or in cases, definitely established, of allergy to such material, removal of the filling is indicated.

4. Poland

use of amalgam: **57% in 2010 / 20% - 26% in 2018**

Draft amendment of the regulation on guaranteed benefits in the field of dental treatment, 17 February 2022: ⁷⁶

- Poland announced on 25 February 2022 to withdraw mercury fillings from the guaranteed benefits without any transition period (effectively **phasing out** dental amalgam). In place of the dental amalgam, the following dental restorative materials will be used for the entire population of beneficiaries:
 - Glass ionomer cements,
 - high density glass ionomer cements and
 - resin-reinforced glass ionomer cements.
- Patients will also be reimbursed for the removal of amalgam fillings as a guaranteed benefit.
- Only dental clinics where amalgam is removed, must be equipped with amalgam separators.

5. Croatia

interim plan until **2025** / use of amalgam: **20% - 70% in 2018**

⁷⁴ https://environmentalmedicine.eu/wp-content/uploads/NAP_23022021.pdf

⁷⁵ <http://www.dentistaitaliano.it/documents/DM10ott2001.pdf>

⁷⁶ <https://environmentalmedicine.eu/wp-content/uploads/dokument544752.pdf>

Nacionalni Plan Mjera Ukidanja Dentalnog Amalgama 2020-2025, September 2020: ⁷⁷

- Since 24 February 2020, alternative fillings (glass ionomer cements with an indication for permanent fillings (glass-hybrid) and composite) have become the standard material for children **up to the age of 18** as well as pregnant and nursing women in compulsory health insurance.
- The right to full reimbursements of alternative fillings will be further extended to **all insured persons by 31 December 2025**, which will effectively **phase out** dental amalgam.

6. Slovenia

use of amalgam: **71% in 2010 / 20% - 70% in 2018**

Nacionalni Načrt o Ukrepih za Postopno Opustitev Uporabe Amalgama v Zobozdravstvu do Leta 2030, 30 June 2021: ⁷⁸

- By **1 January 2025 phase out** of the use of amalgam **in adolescents and young adults aged 16 to 25**.
- By **1 January 2027 phase out** of the use of amalgam **in premolars** (molars Nr. 4+5) in the general population
- By **1 January 2030 phase out of the general use of amalgam**. From 2030 onwards, amalgam fillings will be used **only in specific, exceptional cases**.

The Slovenian public health services will reimburse alternative fillings (composites) instead of amalgam with a limitation for patients not having visited a dentist in the last two years. **The Compulsory Health Insurance Rules will be amended in the coming years.**

7. Slovakia

use of amalgam: **71% in 2010 / 20% - 26% in 2018**

Národný plán opatrení Ministerstva zdravotníctva Slovenskej republiky v súvislosti s postupným ukončovaním používania zubného amalgámu, 27 June 2019: ⁷⁹

- Slovakia anchored a **total ban on amalgam from 1 January 2031** in the national legislation Act no. 578/2004 Coll. The competent regional authority may grant dentists a fine of up to EUR 3,919.
- An **adjustment of the subsidy** for alternative fillings is planned **in the next few years**.
- Glass-ionomer cement, fully covered by all health insurance companies for the entire population, has been identified as a substitute for filling dental cavities.

8. Czech Republic

use of amalgam: **92% in 2010 / 20% - 26% in 2018**

⁷⁷ <https://environmentalmedicine.eu/wp-content/uploads/HR-plan.pdf>

⁷⁸ <https://environmentalmedicine.eu/wp-content/uploads/NationalPlan2021.pdf>

⁷⁹ https://environmentalmedicine.eu/wp-content/uploads/Na%CC%81rodn%C3%BDy%CC%81_pla%CC%81n_opatren_-_amalgama%CC%81m_24._6._2019.pdf

Národní plán týkající se opatření, která Česká republika hodlá provést za účelem postupného omezování používání zubního amalgámu, 10 July 2019: ⁸⁰

- The NAP envisages that **by 2030, the use of dental amalgam will represent only 1%** of the total number of restorations.
- At the latest by **1 January 2025** it should be possible to have **uniform payments for dental fillings regardless of the material** by the public health insurances.
- From 2030 onwards, amalgam fillings will **only be reimbursed in exceptional indications** where no alternatives are available and the patient wishes to have an amalgam filling.

9. Finland

use of amalgam: **3% in 2010 / 1% in 2018**

Plan for the abolition of dental amalgam by 2030, 30 July 2019: ⁸¹

- The long-term objective is to **phase out the use of amalgam completely by 2030**.
- Short-term goals: Reduce amalgam consumption by at least 25% by 2022 from 2019; 50% by 2025 and 75% by 2028.
- In 2021, according to a survey conducted by the Ministry of Social Affairs and Health, 86 % of dental practices did not use amalgam at all. Most dental practices that still used amalgam used it very rarely.
- In Finland, there are **no policies or programs that would favor dental amalgam use over mercury-free dental restoration**, a composite restoration costs the patient the same as an amalgam restoration.⁸²

10. Ireland

use of amalgam: **35% in 2010 / 15% - 19% in 2018**

Ireland's National Plan for Phase-down to Phase-out of Amalgam towards 2030, 1 July 2019: ⁸³

- Ireland supports a phase down **towards phase out/ban of amalgam** across all age groups by 2030.
- The use of amalgam will be **allowed only in exceptional clinical circumstances**. The ongoing need for clinical exemptions will be reviewed periodically.
- The **public payment system will be revised** to support mercury-free alternatives for eligible persons across all age groups.

11. Spain

use of amalgam: **26% in 2010 / 1% in 2018**

⁸⁰ <https://www.mzcr.cz/wp-content/uploads/wepub/17577/38132/N%C3%A1rodn%C3%AD%20pl%C3%A1n%20-%20amalg%C3%A1m.pdf>

⁸¹ <https://environmentalmedicine.eu/wp-content/uploads/FI-plan.pdf>

⁸² First full national reports of the Minamata Convention on Mercury due by 31 December 2021

https://www.mercuryconvention.org/sites/default/files/documents/national_report/Report_Finland_2021.English.pdf

⁸³ <https://environmentalmedicine.eu/wp-content/uploads/Ireland-National-Plan.pdf>

Plan Nacional para la Reducción del Uso de Amalgamas Dentales, 28 February 2020: ⁸⁴

- Spain plans to reduce the use of dental amalgam to exceptional cases (both in the at-risk population and in the general population) **by 2030**.
- Exclusive health centers authorized to place, remodel or extract dental amalgam fillings will be established.

12. Portugal

use of amalgam: **26%** in **2010** / **1%** - **8%** in **2018**

Plano Nacional para Eliminação Gradual da Utilização do Amálgama Dentário, June 2020: ⁸⁵

- The Government of Portugal is committed to progressively reducing the use of dental amalgam by replacing it with other mercury-free materials. It is proposed to reduce the possibility of dental restorations using amalgam in NHS health units (within the scope of primary health care and hospital health care), and **only in duly justified situations**.
- From 2021, whenever the need for an amalgamated restoration is justified, the patient must accept this procedure through the declaration of **informed consent**.

13. Cyprus

interim plan 2019-2024 / use of amalgam: **30%** in **2010** / **10%** in **2018**

Εθνικό Σχέδιο Δράσης της Κυπριακής Δημοκρατίας για τη Σταδιακή Μείωση (phase down) της χρήσης οδοντιατρικών αμαλγαμάτων, 18 July 2019: ⁸⁶

- From **1 January 2025** the use of dental amalgam is **prohibited in persons under the age of 18** unless the dentist considers it strictly necessary because of the patient's specific medical needs.
- Until **1 January 2025** Cyprus assess the possibility of prohibiting the use of dental amalgams throughout the population unless the dentist deems it absolutely necessary due to patient's specific medical needs.

14. Hungary

use of amalgam: **16%** in **2010** / **2%** - **4%** in **2018**

Nemzeti terv a fogászati amalgám használatának fokozatos csökkentését szolgáló intézkedésekről, 24 August 2020: ⁸⁷

- The objective of Hungarian NAP is to **reduce the use below 1% until 2030**,
- The public reimbursement schemes will be adopted and Mercury-free alternative become the preferred choice for new fillings.

15. Netherlands

use of amalgam: **10%** in **2010** / **0,5%** in **2018**

⁸⁴ https://environmentalmedicine.eu/wp-content/uploads/Plan_nacional_amalgamas_dental_01_08_03_2020.pdf

⁸⁵ <https://environmentalmedicine.eu/wp-content/uploads/PT-plan.pdf>

⁸⁶ <http://www.moa.gov.cy/moa/environment/environmentnew.nsf/All/12C3C6502AD31A00C22584430025A4F9?OpenDocument>

⁸⁷ <https://environmentalmedicine.eu/wp-content/uploads/HU-Plan-1.pdf>

Beleidsplan voor terugdringing gebruik amalgaam in de tandheelkunde, 27 June 2019: ⁸⁸

- As soon as the use of amalgam will increase above 1%, the Netherlands will evaluate actions how to further reduce the use.
- The Dutch dentistry faculties have stopped teaching students to use dental amalgam since 1997.
- The Royal Dutch Dental Association (KNMT) announced to produce an overview of the situations in which the use of amalgam is considered medically necessary.

16. Lithuania

use of amalgam: **57% in 2010 / 20% - 26% in 2018**

Įsakymas Dėl Dantų amalgaamų naudojimo tvarkos aprašą patvirtinimo, 25 January 2021: ⁸⁹

- As of **May 2021**, dental amalgams **may only be used** for few limited and justified indications such as
 - for the restoration of defects in the masticatory surfaces of molars (**Class I, II**),
 - medium to large dental cavities (**at least 2 mm deep**),
 - when it is not possible to restore the tooth with an alternative filling due to difficulties in controlling the moisture or the accessibility of the cavity
- The use of dental amalgams is **prohibited** if patients have dentures made of other metals that could cause galvanizes by interacting with the dental amalgam alloy.
- Dentistry students in Lithuanian universities are only introduced to the history of tooth filling, listing the materials used, including amalgams, but they have **not been trained in dental amalgams since 2008**.
- The implemented measures to phase out dental amalgam will be evaluated every calendar year.

17. Austria

use of amalgam: **37% in 2010 / 5% - 7% in 2018**

Nationaler Maßnahmenplan (ÖNAP-Dentalamalgam 2019) zur schrittweisen Verringerung der Verwendung von Dentalamalgam gem. EU-VO 2017/852, 21 June 2019: ⁹⁰

- Since 1995, amalgam is **not indicated in patients with impaired renal function or progressive degenerative diseases of the peripheral or central nervous system**.
- Dental amalgam is not allowed to be used
 - for retrograde root fillings;
 - as material for stump abutments under crowns or bridges;
 - as sealing material for cast crowns.

18. Germany

interim plan / use of amalgam: **10% in 2010 / 5% - 7% in 2018**

⁸⁸ <https://environmentalmedicine.eu/wp-content/uploads/NL-DA-plan-Ministerial-letter-to-NL-Parliament-policy-plan-for-phasing-out-dental-amalgam.pdf>

⁸⁹ https://environmentalmedicine.eu/wp-content/uploads/Lithuania_V-149_2021.pdf

⁹⁰ https://environmentalmedicine.eu/wp-content/uploads/ÖNAP-Dentalamalgam_2019.pdf

The German Government's National Action Plan for the Phase-down of Dental Amalgam, 10 July 2019: ⁹¹

- The Federal Government has set itself the goal of working towards further reducing the use of amalgam in dental treatment and limiting it to indispensable special cases.
- The first National Plan is focusing on further strengthening the prevention of caries and collecting data about the actual use of dental amalgam. It will be periodically updated in subsequent years.
- As of January 01, 2021, dentists are obliged to declare the use of dental amalgam in the invoicing with statutory health insurers.
- Public health insurances fully reimburse composite fillings for children under the age of 15 and pregnant and breastfeeding women, patients allergic to any component of dental amalgam, and patients with severe kidney disease.

19. France

use of amalgam: **50%** in **2010** / **5%** - **25%** in **2018**

Plan national de suppression d'utilisation des amalgames dentaires au mercure en France, 19 April 2021: ⁹²

- The NAP focuses primarily on oral health prevention and highlights the continued decrease in the use of dental amalgam. No measures to further reduce the use are foreseen.
- In 2014, the Agence nationale de sécurité du médicament et des produits de santé (French Agency for the Safety of Health Products) updated its recommendations for the use of dental amalgam⁹³, encouraging professionals to use dental amalgam only for few limited and justified indications.
 - The patient must be fully informed about the different filling materials available before any amalgam-based restoration is performed.
 - Dental amalgam should only be used in posterior permanent teeth (molars and premolars) in the case of multiple and extensive lesions.
 - Dental amalgam should not be used in patients with impaired kidney function and in patients with a known allergy to mercury.
 - The placement of amalgam in direct or indirect contact with precious metal alloys, gold-plated brass anchors (screw-post type) or other metallic restorations should be avoided.
 - It is strongly discouraged to perform whitening on teeth filled with amalgam.
 - The presence of localized lichenoid lesions in direct contact with amalgam fillings may warrant removal of otherwise satisfactory fillings.

20. Estonia

interim plan 2019-2023 / use of amalgam: **5%** in **2010** / **1%** in **2018**

Euroopa Parlamendi ja Nõukogu määrus (EL) 2017/852 elavhõbeda kohta amalgaamiplaan, 25 June 2020: ⁹⁴

⁹¹ <https://environmentalmedicine.eu/wp-content/uploads/DE-DA-plan-EN.pdf>

⁹² <https://environmentalmedicine.eu/wp-content/uploads/FR-Plan-1.pdf>

⁹³ https://environmentalmedicine.eu/wp-content/uploads/Reco-mercure_dentaire_professionnels2014.pdf

⁹⁴ https://environmentalmedicine.eu/wp-content/uploads/kem_amalgaamiplaan.pdf

- Dental amalgam is practically no longer used in Estonia. The measure of the national plan to reduce the use of dental amalgam is to find a solution at the legal level to officially ban the use of amalgam.

21. Latvia

interim plan 2019-2020 / use of amalgam: **32% in 2010 / 20% - 26% in 2018**

The Plan for the Gradual Reduction of the Use of Dental Amalgam in 2019-2020 year, 2 July 2019: ⁹⁵

- Information on the use of amalgam in adult dentistry, is currently not available. Such data should be available in perspective with the introduction of an information system developed by dentists for the period 2020-2021.
- "Procedures for the Organisation and Payment of Health Care Services" (28 August 2018) ensures access to state-funded dental services (including use of alternatives) for **children under 18 years of age**.
- In November 2021 the Ministry of Health published a report about the interim measures ⁹⁶ with findings about the current use. These should serve now for the development of a long-term plan.
- Compared to 2018, there has been a 50.3% reduction in the use of dental amalgam in 2019 and 67.7% in 2020.
- There is no training on the use of Hg amalgam in training programs.

22. Greece

interim plan / use of amalgam: **57% in 2010 / 10% in 2018**

Action Plan for the phasing out of the use of dental amalgams "ANTIPAS", 15 August 2021: ⁹⁷

- The interim National Plan calls for first collecting data on the actual use of dental amalgam.
- The prevention of caries diseases will be promoted.
- A campaign to inform dentists and the public about the health effects of mercury and the contribution that reducing the use of dental amalgam makes to limiting mercury releases is to be launched.

22. Romania

use of amalgam: **71% in 2010 / 20% - 70% in 2018**

Plan național de măsuri pentru eliminarea treptată a utilizării amalgamului dentar, 19 December 2019: ⁹⁸

- Romania will permit the use of dental amalgam only in a selected list of medical clinics.
- Patients will be obliged to complete an **informed consent before using amalgam**.

⁹⁵ https://environmentalmedicine.eu/wp-content/uploads/NAP_DA_Latvia_02072019.pdf

⁹⁶ https://tapportals.mk.gov.lv/legal_acts/5ce73c0c-474e-4c13-8daf-9cc0a9ec7aa4

⁹⁷ <https://environmentalmedicine.eu/wp-content/uploads/eiserx-1493-1.pdf>

⁹⁸ <https://environmentalmedicine.eu/wp-content/uploads/EC-NAP-Rumania.pdf>

Consiliul național al Colegiului Medicilor Stomatologi din România, Moțiune privind reducerea utilizării amalgamului dentar, 14 June 2019: ⁹⁹

- The Romanian Dental Association (Colegiului Medicilor Stomatologi România) had called on the Ministry to immediately extend the ban on the use of dental amalgam to children up to 18 years of age when drafting the national plan for dental amalgam and to completely ban the use of dental amalgam by 1 July 2025.

23. Bulgaria

use of amalgam: **30%** in **2010** / **20%** - **70%** in **2018**

Национален план за мерките за постепенно прекратяване на употребата на дентална амалгама в Република България, 23 October 2019: ¹⁰⁰

- The NAP emphasises the need for data collection, providing information to dentist students as well the need for increased prevention on oral health and provide more information on risks of dental amalgam to the population.
- No further measures to reduce the use are foreseen.

25. Luxembourg

use of amalgam: **26%** in **2010** / **0,5%** in **2018**

Plan national pour la réduction progressive de l'utilisation de l'amalgame dentaire, 3 October 2019: ¹⁰¹

- The Health Directorate has drawn up a national plan which has as its objectives the prevention of dental caries throughout life, easy access to treatment with mercury-free materials, objective communication on risks and alternatives to reduce the use of dental amalgam and professional management of amalgam waste to avoid environmental contamination.
- No further measures to reduce the use are foreseen.

26. Belgium

use of amalgam: **32%** in **2010** / **5%** - **7%** in **2018**

Plan National Belge d'Elimination Progressive des Amalgames Dentaires, 20 Decembre 2019: ¹⁰²

- The NAP focuses primarily on oral health prevention and highlights the ongoing decrease in the use of dental amalgam.
- No further measures to reduce the use are foreseen.

27. Malta

use of amalgam: **57%** in **2010** / **10%** in **2018**

⁹⁹ <https://cmdr.ro/wp-content/uploads/2019/06/Decizia-CN-nr.-10-14.06.2019.pdf>

¹⁰⁰ https://www.mh.government.bg/media/filer_public/2019/10/24/zapoved_nacionalen_plan-prekratiavane_upotreba_amalgama.pdf

¹⁰¹ <https://environmentalmedicine.eu/wp-content/uploads/plan-amalgame.pdf>

¹⁰² <https://environmentalmedicine.eu/wp-content/uploads/BE-plan-in-FR.pdf>

- Malta has not presented a National Plan to reduce the use of amalgam.

5.2. Europe (non-EU)

1. Norway

use of amalgam: **0%**

Review of Norwegian experiences with the phase-out of dental amalgam use, 10 May 2012:
103

- In 1991, Norway issued guidelines that the use of amalgam should be limited due to environmental impacts. Stronger guidelines were issued in 2003, requiring materials other than amalgam to be considered as the first choice in tooth fillings.
- **In 2008 Norway general bans mercury containing products.** This included a ban on amalgam, with an exemption period –now expired –for special cases.
- Amalgam use has been eliminated since 2011.

2. Republic of Moldova

use of amalgam: **0%**

Lege Nr. 277 din 29.11.2018 privind substanțele chimice: ¹⁰⁴

- For the protection of health and the environment, **the production, placing on the market and use of Dental Amalgam is prohibited by 15.02.2020.**

3. New Caledonia (France)

use of amalgam: **0%**

Arrete de l'Haut-Commissariat de la République en Nouvelle-Calédonie, 16 September 2019:
105

- On 16 September 2019 the Haut-Commissariat de la République en Nouvelle-Calédonie decided to **immediately stop the use of dental amalgam** and referred to the National Medical Devices Regulation.

4. Russia

use of amalgam: **0%**

Report of the Informal Global WHO consultation with policymakers in dental public health, 2021. Monitoring country progress in phasing down the use of dental amalgam. Geneva: World Health Organization; 2021: ¹⁰⁶

¹⁰³https://www.mercuryconvention.org/sites/default/files/documents/submission_from_government/Norway3_DentalAmalgam.pdf

¹⁰⁴ https://environmentalmedicine.eu/wp-content/uploads/Republic-Moldova_EN.pdf

¹⁰⁵ <https://environmentalmedicine.eu/wp-content/uploads/New-Caledonia-Phase-Out-2019.pdf>

¹⁰⁶https://www.mercuryconvention.org/sites/default/files/documents/information_document/4_INF26_DentalAmalgamWHO.English.pdf

- The Russian Federation consistently reported to have phased out use of dental amalgam

5. Mongolia

use of amalgam: **0%**

First full national report of the Minamata Convention on Mercury due by 31 December 2021:¹⁰⁷

- Purchase and usage of mercury-added dental amalgam were banned by the joint order 07/27 of 2011 by the Minister and Health and the Chief of National Emergency Management Authority.

6. Kazakhstan

use of amalgam: **0%**

Report on second level mercury inventory in the Republic of Kazakhstan, 2019: ¹⁰⁸

- Dental amalgam is not used in the Republic of Kazakhstan

7. Armenia

use of amalgam: **0%**

Minamata Convention Initial Assessment Report, Armenia, 2019: ¹⁰⁹

- Dental fillings containing mercury, are not used in dental clinics of Armenia for a long time already

8. Azerbaijan

use of amalgam: **0%**

Minamata Convention Initial Assessment Report, Azerbaijan, 2018: ¹¹⁰

- There is no use of dental amalgams in Azerbaijan

9. Georgia

use of amalgam: **0%**

Minamata Convention Initial Assessment Report, Georgia, 2017: ¹¹¹

¹⁰⁷https://www.mercuryconvention.org/sites/default/files/documents/national_report/Report_Mongolia_2021.English.pdf

¹⁰⁸https://www.mercuryconvention.org/sites/default/files/documents/minamata_initial_assessment/Kazakhstan-MIA-2019.pdf

¹⁰⁹https://www.mercuryconvention.org/sites/default/files/documents/minamata_initial_assessment/Armenia-MIA-2019.pdf

¹¹⁰https://www.mercuryconvention.org/sites/default/files/documents/minamata_initial_assessment/Azerbaijan-MIA-2018.pdf

¹¹¹https://www.mercuryconvention.org/sites/default/files/documents/minamata_initial_assessment/Georgia-MIA-2017.pdf

- Dental amalgam is no more in use by dental clinics and not imported in the country.

10. Switzerland

current use of amalgam: **less than 1%**¹¹²

Chemikalien-Risikoreduktions-Verordnung, ChemRRV of 18 May 2005 (as of 1 December 2020): ¹¹³

- In September 2015 Switzerland amended the Swiss Ordinance on Risk Reduction (ChemRRV) related to chemical products to prohibit the use of dental amalgam in cases where mercury-free alternative can be preferred for medical reasons.
- In any case, the patient's consent to the treatment procedure is absolutely necessary.
- In July 2018 Switzerland amended the ChemRRV to end the export of mercury for use in dental amalgam capsules by 31 December 2027.

11. Liechtenstein

First full national report of the Minamata Convention on Mercury due by 31 December 2021:¹¹⁴

- Dental amalgam is regulated in the Swiss ChemRRV ordinance. This ordinance applies in Liechtenstein based on the Customs Union Treaty.
- According to ChemRRV the use of dental amalgam is prohibited. An exemption from the general prohibition is granted if priority cannot be given to a different filling material for medical reasons

12. Iceland

Lög um breytingu á efnalögum, nr. 61/2013, með síðari breytingum, 11 June 2019: ¹¹⁵

- From **1 July 2019** the use of dental amalgams for the dental treatment of **deciduous teeth, children under the age of 15 and pregnant and breastfeeding women** is prohibited.
- The Minister of Health, in consultation with the Minister in charge of public health and prevention, announced to issue an action plan for measures that need to be taken in order to reduce the use of dental amalgam. The action plan shall be made public.

13. Albania

Vendim Nr. 442 Për miratimin e rregullave të ndalimit të eksportit të merkurit metalik, komponimeve dhe përzjerjeve të caktuara të merkurit, ruajtjes së sigurt të merkurit metalik

¹¹² Statement of the Swiss Dental Association (SSO), Neue Züricher Zeitung, 14.03.2017
<https://www.nzz.ch/wissenschaft/zahnmedizin-eu-will-kein-zahnamalgam-fuer-kinder-und-schwangere-ld.151257>

¹¹³ <https://environmentalmedicine.eu/wp-content/uploads/ChemRRV-2005.pdf>

¹¹⁴ https://www.mercuryconvention.org/sites/default/files/documents/national_report/Report_Liechtenstein_2021.English.pdf

¹¹⁵ https://environmentalmedicine.eu/wp-content/uploads/1790_Law_2019.pdf

dhe të kriteret specifike të ruajtjes së merkurit metalik të konsideruar si mbetje, 26. June 2019: ¹¹⁶

- From **1 July 2021** the use of dental amalgams for the dental treatment of deciduous teeth, children under the age of 15 and pregnant and breastfeeding women is prohibited.
- By **1 July 2021** the Ministry of Health should prepare a national plan with measures to be taken for phasing out the use of dental amalgam.

14. United Kingdom

use of amalgam: **71%** in **2010** / **15%** - **19%** in **2018**

The Control of Mercury (Amendment) (EU Exit) Regulations 2018, 25 January 2019: ¹¹⁷

- The European mercury regulation from 2017 has passed into national law post-Brexit, prohibiting the use of dental Amalgam for dental treatments of deciduous teeth, children under the age of 15 and pregnant and breastfeeding women in **England, Scotland, Wales and Northern Ireland**.

¹¹⁶ <https://turizmi.gov.al/wp-content/uploads/2019/07/vkm-442-2019-per-ndalimin-e-eksportit-te-merkurit.pdf>

¹¹⁷ <https://www.gov.uk/eu-withdrawal-act-2018-statutory-instruments/the-control-of-mercury-amendment-eu-exit-regulations-2018>