

3. Mercury control – how far have we come?

Decades have passed since the tragic pollution episodes in Japan and Iraq first demonstrated that the foetal brain is particularly susceptible to methyl-mercury toxicity. It is more than seven years since research findings from a long-term study in the Faroe Islands, co-sponsored by the European Commission, showed conclusively that low-level exposure to mercury in the womb could cause brain damage in children.

Too little has happened since. Government authorities have continued to argue about the correct 'intake dose' for mercury and while mercury emissions in some countries have reduced, globally emissions may be rising^k.

However, the challenge of reducing mercury pollution is now climbing up the political agenda. Many authorities worldwide have recognised the toxicity of mercury and undertaken specific measures to reduce mercury pollution, our exposure to it and to phase out its use. More significantly, progressive countries are concerned with the global nature of mercury pollution. The issue has been taken in its entire complexity. It has been recognised that it is not sufficient to just decrease mercury exposure to tolerable levels in their own countries, but that a long-term, global solution is needed.

The biggest concern is the shift of mercury pollution to Global South countries. Scientific studies prove that persistent chemicals contaminate even remote areas far from pollution sources and that global pollution has serious effects especially on populations dependent on – or accustomed to – marine diets, for instance the Inuit of the Arctic. International action is therefore needed to address mercury pollution and exposures. The European Union is taking a leading role with its Mercury Strategy, which attempts to address this problem as does the UNEP Mercury Programme.

Global action

The United Nations Environmental Programme (UNEP) has taken a lead in bringing together countries to discuss policy solutions for reducing mercury. Internationally, UNEP initiated a Global Mercury Assessment⁸¹, which resulted in the establishment of a mercury programme within its chemicals unit in

^k Global emissions grew about 20% between 1990 – 2000. European emissions fell by 60% during the same period, although Europe remains a net 'exporter' of transboundary mercury pollution (i.e. there is more deposition outside Europe from European emissions than deposition within Europe as a result of emissions in other regions) (European Commission SEC(2005)101).

2003. This programme was further strengthened by the Governing Council in February 2005 (see box), who will consider the need for further action at its next session, including the possible adoption of a legally binding instrument⁸².

OUTCOME OF UNEP GOVERNING COUNCIL, FEBRUARY 2005⁸³

- ▲ To report on supply, trade and demand for mercury on the global market
- ▲ To facilitate partnerships to reduce risks to human health & environment from mercury
- ▲ To encourage Governments, intergovernmental agencies, non-governmental agencies and the private sector to take immediate actions to reduce the risks to human health and environment posed on a global scale by mercury in products and production processes.

The Global Mercury Assessment states that local, regional or national measures are often insufficient to tackle mercury contamination. Despite a number of measures taken by some countries, these were not sufficient and mercury pollution still remains an issue, due to long-range transport of pollution. Even nations with minimal mercury releases, and other areas remote from industrial activity, are adversely affected.

The Global Mercury Assessment also notes that although industrialised countries have successfully reduced mercury emissions and alternatives to mercury containing products are readily used and available, less developed countries do not have such strict mercury regulations or it is difficult to enforce them sufficiently.

Because mercury exposure comes primarily from fish consumption, the mercury contamination of lakes, rivers and especially oceans requires global action. The Assessment therefore calls on governments to consider developing a legally binding agreement that would reduce risks to human health and the environment from the release of mercury and its compounds.

The World Health Organization has also issued a policy paper calling for the gradual global phase-out of mercury-based medical devices. Several countries are beginning to implement this policy (see Case Study, Mercury Free Hospitals, Page 23).

EU mercury strategy

The European Union adopted its Mercury Strategy in January 2005. It is a positive initiative comprised of a wide range of legislative, policy and market measures to reduce mercury's impact. The Strategy also prioritises better education and measures to protect those groups most vulnerable to health damage from mercury⁸⁴.



EU MERCURY STRATEGY PRIORITIES:

- 1. Reduce mercury emissions**, i.e. implement and review measures that require polluters to adequately control emissions (such as adequate control of emissions from chlor-alkali plants or emission to water from dental amalgam clinics) and subsequently move to best available technologies that do not require mercury.
- 2. Reduce** the entry of **mercury** into the environment **by cutting the demand and supply**, i.e. ban the use of mercury in remaining products and practices such as measuring devices – thermometers, blood pressure devices, dental amalgam and chlorine production. Subsequently, the EU will ensure that the surplus mercury from the phased out products and services will not be exported to other parts of the world. Apart from cutting the primary mining of mercury, EU will adopt a mercury export ban.
- 3. Resolve** the long-term fate of **mercury surpluses and reservoirs**, i.e. looking for the best solution for **long-term storage** of mercury surpluses from phased out products and services.
- 4. Protect against mercury exposure**, i.e. providing information on dietary recommendation for fish consumption which is the primary source of mercury exposure. The EU will bio-monitor the levels of mercury in EU population, see that the mercury content in drinking water is under the limits etc.
- 5. Support and promote international action on mercury**, i.e. supporting technology transfer of mercury-free practices, establishing a funding scheme for countries dependent on mercury technologies and advocating for global phase-out of mercury production and use by introducing an international legally binding agreement on mercury.

Getting rid of mercury in products: highlights from EU action so far

The European Union has already implemented a number of measures restricting the use of mercury in certain everyday products. Such restrictions are very effective as they prevent additional mercury entering the market and consequently the environment. Other measures address mercury in the waste stream and mercury in our diet.

▲ **Waste** Mercury is classified as hazardous waste and therefore strict regulations apply to the disposal of waste containing mercury; the incineration of waste containing mercury is forbidden, and where possible it is recovered. Mercury-containing dental amalgam waste is considered to be hazardous waste within the European Union, and must be disposed of in accordance with applicable laws⁸⁵. There are other measures regulating mercury waste from cars and other vehicles.

▲ **Batteries** The first product to be regulated was batteries, which used to be amongst the largest users of mercury. In 1991, the EU enacted a Directive which successfully eliminated the use of mercury in batteries⁸⁶. A new Directive 2006/66, repealing the first one, now also requires the collection of used batteries, especially batteries containing lead or cadmium.⁸⁷

▲ **Water** In 2000, the EU also implemented a wide number of measures regulating the disposal of mercury into water, sludge and soils through the Water Framework Directive⁸⁸.

▲ **Electric and electronic equipment** The use of mercury in electric and electronic equipment was restricted under the ROHS Directive, agreed in 2002⁸⁹. From 1 July 2006, new electrical and electronic equipment put on the market shall not contain a number of specified hazardous substances, including mercury¹. Unfortunately, electric and electronic **medical** devices are exempted from this directive.

▲ **Electronic waste** A Directive was agreed at the same time, on waste electric and electronic equipment⁹⁰ that requires manufacturers to take back and recycle their own products at the end of their lives, free of charge. This introduces the concept of 'producer responsibility' and discourages the use of hazardous substances in products as this adds to the difficulty and cost of recycling.

▲ **Dental amalgam in EU member states** Several EU Member States including Denmark and Sweden have already initiated the continuous phase out of mercury in dental amalgam with a combination of voluntary and legislative measures. Sweden has made dental amalgam more cost-neutral against other filling materials by denying it insurance coverage. Alternatives were made preferable and more affordable by changing the insurance policy that often disqualified them against the fully covered dental amalgam⁹¹. Vulnerable populations including pregnant women, children and youth were identified to be the first to be protected against dental amalgam use.



¹ The other substances were lead, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

▲ **Fish consumption recommendations** The European Food Safety Authority (EFSA) has also made a recommendation on consumption of fish by women of childbearing age, followed by an 'Information Note' released by the European Commission (see Chapter 1, box on fish consumption). However, it is unclear how widely EU and national guidelines are disseminated and promoted. Returned questionnaires from the women taking part in our hair sample testing survey revealed that many women are unaware or confused about what fish to be wary of and during which periods of their life.

Currently, there is no EU regulation regarding the proper collection and disposal of mercury thermometers and other measuring equipment. The use of mercury cells in the chlor-alkali industry will also continue until 2020, despite a 1990 Paris Commission (PARCOM/OSPAR)⁹² recommendation to phase them out by 2010^{93m}.

EU level action in the pipeline

The European Mercury Strategy has foreseen a number of additional measures that should address the continuous use of mercury in certain products and the export of mercury.

▲ **Non-electric and non-electronic measuring equipment**

One most relevant to the health community is what is known as the Limitations Directive⁹⁴ which bans or restricts certain chemicals from the EU market, and in this case would ban the use of mercury in certain measuring and control devices. In 2006, the Commission proposed a directive that would ban mercury for some public and some healthcare measuring devices such as thermometers. In September, the EU Parliament introduced an amendment to the Commission's proposed Directive to widen its scope. The amendment included blood pressure devices for use in hospitals that were exempt in the Commission's original proposalⁿ. The reason for including blood pressure devices is that of all mercury instrumentation used in health care, sphygmomanometers contain a significant mass of mercury per device (approximately 80 to 100 g/unit). At a plenary vote in November 2006, the European Parliament rejected a compromise deal with EU Member states where the European Commission

would report within two years on the feasibility of phasing out mercury in devices such as blood-pressure measuring devices used and industrial applications, with a view to banning these "whenever technically and economically feasible" The amendment will therefore be considered at a second reading in the European Parliament in early 2007.

▲ **EU export ban and safe storage of metallic mercury**

The other very significant step forward is the EU plan to reduce the movement of mercury globally, by banning the export of mercury. Europe represents one of the largest exporters of raw mercury accounting for about 1000 tonnes per year (out of global export of 3600 tonnes per year)⁹⁵. The European Union has already committed to passing a law which would ban the export of mercury by 2011 at the latest. An effective export ban should cover not only metallic mercury, but also mercury compounds and mercury containing products already restricted on the EU market.

▲ **Dental amalgam**

The European Parliament also recommended urgent consideration of restricting mercury use in dental amalgams, particularly with regard to high-risk sections of the population⁹⁶. It encouraged the Commission to review the use of alternative dental fillings.

"The EU is the world's largest mercury exporter, and most of its mercury goes to developing countries. This dangerous neurotoxin is often haphazardly used and released, contaminating workers, their families, local communities and global food supplies. By proposing an EU mercury export ban and safe storage of metallic mercury, the European Commission has taken a leadership role in the world through its hands-on approach to reducing mercury in the environment."



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^m Environment and health groups are also urging the EU to make this phase out by 2010 one of its highest priorities. However, the European chlorine industry has resisted this recommendation and says that it intends to close or convert mercury cell facilities only when economically favourable. Euro Chlor member companies' current commitment is to convert to membrane technology or closure of mercury cells by 2020 (see www.eurochlor.org).

ⁿ The European Commission originally wanted to ban sphygmomanometers for domestic use only, exempting their use in hospitals and laboratories.

Biomonitoring in Europe

While people across Europe are exposed to methyl mercury through consumption of fish at a level that could be having detrimental impacts on health and development, there is little awareness of this problem or of what steps can be taken to reduce exposure. There may be specific groups that are particularly exposed, such as dentists that use amalgam, health workers using equipment containing mercury, and patients of both of the above.

At present, the EU does not have a coordinated approach to biomonitoring, and thus is not able to provide comparable European data on how exposed people are to various pollutants, such as mercury. However, in its recent Action Plan on Environment and Health, the EU prioritises setting up such a system and commits to launching a human biomonitoring pilot-project in 2007 which will initially focus only on a few pollutants. Methyl mercury will be one of these pollutants and biomonitoring activities will target women of child bearing age and children.

The ultimate aim of human biomonitoring is to support environmental policy as well as public health policy by better data comparability and accessibility within and between countries and more effective use of resources through shared development of scientific tools and appropriate strategies.

How will the EU use biomonitoring?

The European Commission is preparing the ground for its pilot project through an EU funded project called ESBIO (Expert team to Support BIOMonitoring) and a technical working group comprised of government representatives and human biomonitoring experts.

The European Community foresees the use of human biomonitoring to develop political strategies in various ways:

- ▲ To serve as an early warning function and highlight the need to develop new political strategies on a European scale
- ▲ To provide an indication of the different importance of sources, exposure, regional and geographic aspects etc. Considering this information might lead to adaptations of existing political policies
- ▲ To evaluate and assess existing policies⁹⁷.

A five year EU research project called PHIME (Public health impact of long-term, low-level mixed element exposure in susceptible population strata) will focus on understanding better the links between heavy metals and health, particularly in relation to children and pregnant women and low level exposure. Several of the work packages will focus on obtaining comparable biomonitoring data across the 22 countries, and on studying further the effects of methyl mercury exposure in the womb and early life on child development in a number of fish eating communities⁹⁸.