



EUROPE

ENVIRONMENT AND HEALTH

International Conference 18-20 April 2008 Salsomaggiore, Italy

Heavy Metals: New International Strategies to Phase-out Lead, Mercury and Cadmium

(Intergovernmental Organizations)

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Focus

This presentation focuses on new international strategies to address the health and environment risks of mercury, lead and cadmium

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World Summit on Sustainable Development (WSSD)

Johannesburg Plan of Implementation

III. Changing unsustainable patterns of consumption and production

23. Renew the commitment, in Agenda 21,

"aiming to achieve, by 2020, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment"



World Summit on Sustainable Development (WSSD)

Johannesburg Plan of Implementation

III. Changing unsustainable patterns of consumption and production

- (g) Promote reduction of the risks posed by heavy metals that are harmful to human health and the environment, including through a review of relevant studies, such as the United Nations Environment Programme global assessment of mercury and its compounds.



World Summit on Sustainable Development (WSSD)

Johannesburg Plan of Implementation

VI. Health and sustainable development

- 56. b Support the phasing out of lead in gasoline;
- 57. Phase out lead in lead-based paints and in other sources of human exposure, in particular, **children's exposure** to lead and strengthen monitoring and surveillance efforts and the treatment of lead poisoning.

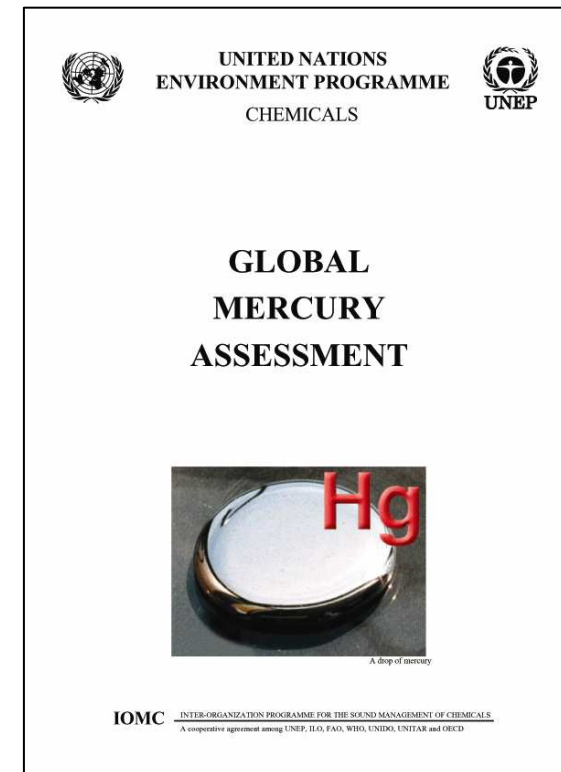
UNEP Global Mercury Assessment

Initiated by UNEP Governing Council in February 2001 (21st session)

Assessment concluded:

Sufficient evidence of significant global adverse impacts to warrant further international action

Outlined possible options for addressing problems-short, medium and long-term goals



UNEP Mercury Programme

Governing Council decisions:
(22nd session-Feb 2003)

- Urged all countries to adopt goals and take national actions
- Requested UNEP to initiate technical assistance and capacity building activities to support the efforts of countries to take action regarding mercury pollution

UNEP established the Mercury Programme

UNEP Mercury Programme

Main elements of the programme include assistance to countries to understand and address mercury problems through:

- Building inventories of uses and releases
- Identifying populations at risk
- Developing communication and outreach to at risk populations
- Initiating actions to reduce uses and releases of mercury, including promoting mercury-free products, technologies and processes, using environmentally friendly alternatives

UNEP Mercury Programme

Governing Council decisions:

(23rd session-Feb 2005)

- continued to consider further measures to deal with the significant global adverse impacts of mercury
- strengthened the UNEP mercury programme
- called for partnerships between Governments and other stakeholders as one approach to reducing risks to human health and the environment from the release of mercury and its compounds to the environment

UNEP Mercury Programme

Governing Council decisions:
(24th session-Feb 2007)

- recognised that efforts to reduce risks from mercury were not sufficient to address the global challenges posed by mercury
- concluded that further long term international action is required
- called for a review and assessment of the options of enhanced voluntary measures and new or existing international legal instruments in order to make progress in addressing this issue

UNEP Mercury Programme

Governing Council decisions:
(24th session-Feb 2007)

Two major areas of work:

- the strengthening of the UNEP mercury programme partnerships
- the establishment of an ad hoc open-ended working group of Governments, regional economic integration organizations and stakeholder representatives to review and assess options for enhanced voluntary measures and new or existing international legal instruments.



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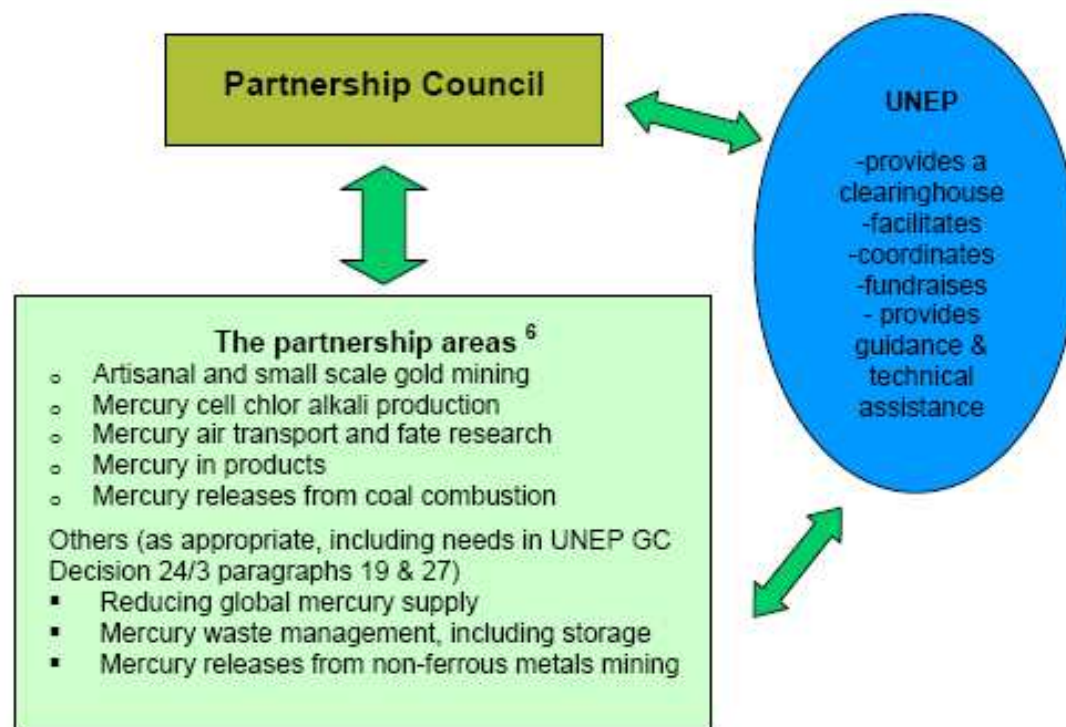
Mercury Partnerships

Mercury partnerships address five areas:

- Mercury releases from coal combustion
- Mercury cell chlor-alkali production
- Mercury in products;
- Mercury air transport and fate research; and
- Mercury in artisanal/small-scale gold mining;

UNEP Global Mercury Partnership

Figure 1 - Proposed Organizational Structure for the UNEP Global Mercury Partnership ⁶



UNEP Mercury Programme

Supporting country efforts to take action on mercury pollution-funding to support partnerships, projects and activities on:

- Promoting the development of national inventories of mercury uses and releases;
- Developing strategies for enhanced outreach and risk communication activities to reach at-risk populations, including sensitive populations;
- Increasing public awareness and promotion of mercury-free products, technologies and processes, using and/or with environmentally friendly alternatives;
- Promoting application and sharing of information on best available techniques and measures to reduce mercury emissions from point sources;

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UNEP Mercury Programme

- Promoting reduction of risk of exposure related to mercury in products such as batteries, cosmetics and thermometers and to production processes such as chlor-alkali production and small-scale artisanal mining using mercury through, for example, when warranted, introduction of bans or restrictions on uses;
- Increasing awareness of environmentally sound recycling practices and promoting the development of environmentally sound waste management, disposal and remediation practices;
- Developing national implementation plans to reduce mercury uses and releases ;
- Conducting training and workshops on various sectoral or regionally relevant topics;
- Improving global understanding of international mercury emission sources, fate and transport.

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Partnership Projects

- ***China Hospitals Project:***
- Partners: China (Beijing), United States, Healthcare Without Harm (HCWH)
- ***Basel Mercury Waste Capacity Building from Products Partnerships***
- Partners: Product Partnership countries needing assistance with building capacity for managing mercury waste, United States, Basel Convention Secretariat
- ***Buenos Aires Hospital Project.***
- Partners: Buenos Aires City Government, United States, Healthcare Without Harm, UNEP
- ***Burkina Faso Assessment:***
- Partners: Burkina Faso, United States, [UNEP]
- ***Chile Inventory Development and Risk Management Planning***
- Partners: Chile, United States, UNEP, UNITAR
- ***Costa Rica Hospitals Assessment Project.***
- Partners: Costa Rica, United States, Basel Convention Secretariat
- ***Ecuador Inventory Development and Risk Management Planning***
- Partners: Ecuador, United States, UNITAR

Partnership Projects

- ***Mexico Healthcare Project:***
- Partners: Mexico, United States, Healthcare Without Harm, North American Commission for Environmental Cooperation (NACEC)
- ***Mexico Products Inventory Update:***
- Partners: Mexico, United States, NACEC
- ***Americas Workshop to Reduce Mercury in Products***
- Partners: Mexico, United States, NACEC, UNEP
- ***Panama Mercury Inventory and Risk Management Planning***
- Partners: Panama, United States, SAICM, UNEP, UNITAR
- ***South Africa Assessment*** (Pending)
- Partners: South Africa, United States, UNITAR
- ***Southeast Asia Workshop on Mercury Use in Products***
- Partners: Thailand, United States, UNEP

For more information: <http://www.unep.org/themes/chemicals/>

UNEP-Lead and Cadmium

Governing Council
(23rd session, Feb 2005)

- Requested that UNEP undertake the development of reviews of scientific information on lead and cadmium, focusing especially on long-range environmental transport

Key findings showed that there is risks to human health and the environment arising from the release of lead and cadmium into the environment, and that it may warrant international action.

UNEP-Lead and Cadmium

Lead

- Transport
- Use
- Waste disposal
- Exposure
- Toxicity

Cadmium

- Transport
- Use
- Waste disposal
- Toxicity

Global Efforts-IFCS

IFCS Forum V
Budapest, 25-29 September 2006

Budapest Statement on Mercury, Lead and Cadmium

"called for further global, regional, national and local actions as appropriate. IFCS, in this statement, invited the UNEP Governing Council to initiate and strengthen voluntary actions, including partnerships and other activities, as well as giving high priority to considering measures, as appropriate, on lead and cadmium"

UNEP GC Feb 2007

Forum VI Pb and Cd in products traded internationally-health concerns



UNEP-Lead and Cadmium

(24th session, Feb 2007)

- Requested the Executive Director to provide available information on lead and cadmium to address the data and information gaps identified in the Interim Reviews and to compile an inventory of existing risk management measures

Lead-Global Gaps Identified

- Updated global release inventories for lead
- More data on releases to the environment in developing countries are especially needed
- There is a need to develop atmospheric transport models for lead in the Southern hemisphere,
- Ocean transport of lead in general is poorly understood and seems to warrant more investigation;
- The release inventory database needs to be improved also in the developed regions, :
- Develop/improve emission factors for various major source categories (coal and oil contents and releases, releases from ferrous and non-ferrous metal industry;

Lead-Global Gaps Identified

- Improve understanding of the contributions of natural sources and re-suspension of historical depositions to lead pollution levels;
- Improve data quality of national release inventories.
- Develop guidelines for monitoring activities (air, soil, precipitation, human blood etc.);
- The mechanism of lead toxicity is not well understood.

Lead-Global Gaps Identified

- Exposure-response relationship is incomplete for many effects. A series of deterministic risk assessments exist but there is a lack of probabilistic risk assessments.
- The substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries are major causes of human exposure to lead.
- There are gaps on lead flows so research in this area is necessary in order to set priorities to global action to reduce risks

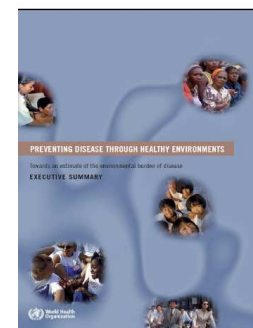
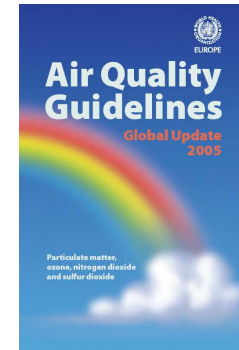
WHO

WHO-international UN agency responsible for health

- Produces health guidelines and standards
- Helps countries to address public health issues
- Supports and promotes health research

Different programmes address the threats to health posed by environmental pollutants by:

- providing information and guidelines for risk assessment and management,
- preventing human exposure
- improving the diagnosis, treatment and surveillance of health effects.





World Health Organization

- **Environmental Health Criteria (EHC) Monographs**
- **Concise International Chemical Assessment Documents (CICADS)**
- **International Chemical Safety Cards (ICSCs)**
- **Poisons Information Monographs (PIMs)**

www.inchem.org

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World Health Organization

- **Drinking Water Quality Guidelines**
http://www.who.int/water_sanitation_health/dwq/gdwq3rev/en/
- **Air Quality Guidelines**
http://www.who.int/phe/health_topics/outdoorair/en/index1.html
- **JECFA evaluation** (Joint FAO/WHO Expert Committee on Food Additives)
<http://www.who.int/ipcs/food/jecfa/en/>
- **IARC Monographs**
<http://monographs.iarc.fr>
- **The Global Advisory Committee on Vaccine Safety (GACVS): Thiomersal**
http://www.who.int/vaccine_safety/topics/thiomersal/en/index.html



WHO

- **Mercury - Assessing the environmental burden of disease at national and local levels.**
Environmental Disease Burden Series No.16.2008
http://www.who.int/quantifying_ehimpacts/national/en/index.html
- **Guidance for Estimating Exposure to Mercury to Identify Populations at Risks (UNEP/WHO) – 2008**
<http://www.chem.unep.ch/>



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International Conference 18-20 April 2008 Salsomaggiore, Italy

WHO

- **Mercury and children's health - Training Module of the WHO Training Package for the Health Sector on Children's Environmental Health**
- **Risk Assessment of Children's Exposure to Chemicals (Environmental Health Criteria 237)**
- **Mercury and Child Health** (under preparation)



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ENVIRONMENT AND HEALTH

International Conference 18-20 April 2008 Salsomaggiore, Italy

WHO

- **Fact sheet: Exposure of children to chemical hazards in food**
http://www.enhis.org/object_document/o4736n27387.html
- **Mercury in Health Care**
http://www.who.int/water_sanitation_health/medicalwaste/mercurypolpaper.pdf
- **Exposure to Mercury: a major public health concern**
<http://www.who.int/phe/news/Mercury-flyer.pdf>

Guidance tools to support monitoring of actions and evaluations-Indicators

Indicators CEHAPE RPG 4

Indicator Title	Data source	Age
Policies to lower excessive UV exposure	Member States	YES
Incidence of melanoma	IARC	YES
Incidence of childhood leukaemia	IARC	YES
Work injuries in employees under 18 yrs	EUROSTAT	YES
Children's exposure to chemical hazards in food	WHO TDS	NO
Blood lead level in children	Case studies	YES
POPs in human breast milk	WHO survey	YES
Children exposed to harmful noise at school	Future	YES

Reporting tools



Blood lead levels in children

FACT SHEET NO. 4.5 · MAY 2007 · CODE: RFG4_Chem_Ext

The level of lead in the blood of children in a community, expressed as the geometric mean of individual blood lead levels in micrograms per decilitre (µg/dl).

KEY MESSAGE

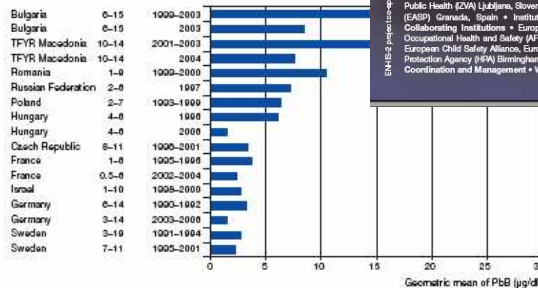
The phasing out of lead from petrol, first in western Europe and then in the rest of Europe, has resulted in a significant decrease in blood lead levels in children over the last few decades. Industrial emissions are still important local sources of lead. In many countries, lead from petrol has been phased out from petrol, other sources of exposure to lead have become increasingly significant. It is still necessary to reduce the exposure to lead because there is no known safe level in children.

An efficient surveillance system, using comparable methods of blood lead measurement to monitor lead levels in children's blood, is urgently required for the identification of the remaining sources of exposure to lead and monitoring of the effectiveness of interventions.

RATIONALE

Lead is one of the best known toxic heavy metals. The level of lead in the blood is a biological marker of recent exposure to lead. Elevated blood lead levels are associated with toxicity to the developing brain and nervous system, lower intelligence quotient (IQ) (1). According to recent evidence, blood lead levels in children with blood lead levels below 10 µg/dl, so prevention actions should be taken to bring down the levels of lead in the blood to the lowest possible level.

Fig. 1. Mean blood lead levels (PbB) of children measured in selected European countries, 1991–2006 (age 6–15)



Note. TFYR Macedonia = The former Yugoslav Republic of Macedonia. Bulgaria 1999-2003; data represent industry. Bulgaria 2003; data represent traffic. The former Yugoslav Republic of Macedonia 2001-2003 and 2004; data represent industry (see Assessment section below, third paragraph). Data for Bulgaria (2003), the Czech Republic and The former Yugoslav Republic of Macedonia are arithmetic means.

Source: Country case studies (4-15).



Partner Institutions • Austrian Health Institute (OHK) Vienna, Austria • Ministry of Health (MOHEC) Sofia, Bulgaria • State Health Institute (SHI) Prague, Czech Republic • Health Protection Inspectorate (HPI) Tallinn, Estonia • National Public Health Institute (NPHI) Stockholm, Finland • French Institute for Public Health Surveillance (InVS) St Maurice, France • Institute of Public Health North Rhine-Westphalia (IÖGD) Düsseldorf, Germany • National School of Public Health (NESP) Athens, Greece • National Institute for Environmental Health (NIEH) Budapest, Hungary • Agency for Environmental Protection and Technical Services (APST) Rome, Italy • State Environmental Health Centre (SEHC) Vilnius, Lithuania • National Institute for Public Health and the Environment (RIVM) Bilthoven, The Netherlands • Institute of Occupational Medicine and Environmental Health (IMPZS) Sosnowiec, Poland • General Directorate of Health (DGDS) Lisbon, Portugal • Institute of Public Health Bucharest (IPB) Bucharest, Romania • National Public Health Authority of Slovak Republic (NPAH) Bratislava, Slovakia • National Institute of Public Health (ZVA) Ljubljana, Slovenia • Public Health Agency of Barcelona (ASB) Barcelona, Spain • Andalusian School of Public Health (EASP) Granada, Spain • Institute of Health Carlos III Foundation for International Cooperation and Health Madrid, Spain • Collaborating Institutions • European Environment Agency (EEA) Copenhagen, Denmark • French Agency for Environmental and Occupational Health and Safety (AFSSE) Mantes-la-Jolie, France • European Commission Joint Research Centre (JRC) Ispra, Italy • European Child Safety Alliance, EuroSafe Amsterdam, Netherlands • National Board of Health and Welfare Stockholm, Sweden • Health Protection Agency (HPA) Birmingham, United Kingdom • Coordination and Management • World Health Organization European Centre for Environment and Health, Bonn Office, Bonn, Germany



Exposure of children to chemical hazards in food

FACT SHEET NO. 4.4 · MAY 2007 · CODE: RFG4_Food_Ext

Assessment of exposure to potentially hazardous chemicals in children's food.

This assessment assesses the exposure of children to potentially hazardous chemicals in their food. It focuses on the lowest safety margins, namely toxic metals, arsenic and polychlorinated biphenyls (PCBs). In the current situation only the available data have been considered. They mainly address adult population-specific data are only available for children aged 4-6 years in Germany.

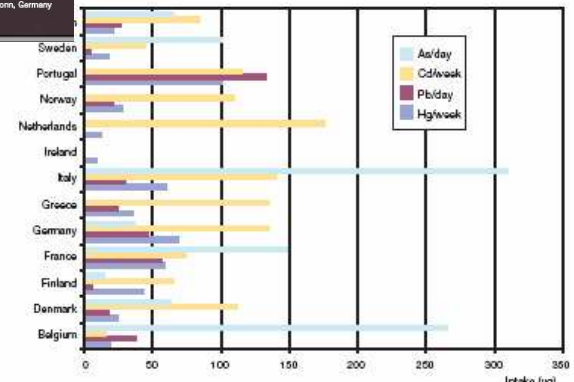
KEY MESSAGE

A partial assessment can be made of the extent to which children are exposed to chemical hazards in European countries. In many countries, information on exposure to chemical hazards in food for the whole population, not specifically for children. When it is collected, it may be incomparable with other countries. In order to assess exposures to hazardous chemicals through food, more information needs to be harmonized and data collected regularly that reflect the specific risks to children.

RATIONALE

Exposure to hazardous chemicals during growth and development can result in acute long-term effects on children. The strict regulations and measures applied in European countries mean that food is generally free of contamination. However, contamination of food may still present an important route of exposure to chemical hazards. In many countries, food safety systems are developing and they generally consume more food on a body weight basis than adults. Children are particularly at risk of illness from exposure to chemical hazards in food. This indicator focuses on nutrients in food, mainly toxic metals. Unacceptably high exposures can be avoided when the levels of substances in food are monitored.

Fig. 2. Average metal intake through food by adults, selected EU countries, 2004



Note. The intake of mercury (Hg) and cadmium (Cd) is weekly, that for lead (Pb) and arsenic (As) - daily. Source: European Commission (1).





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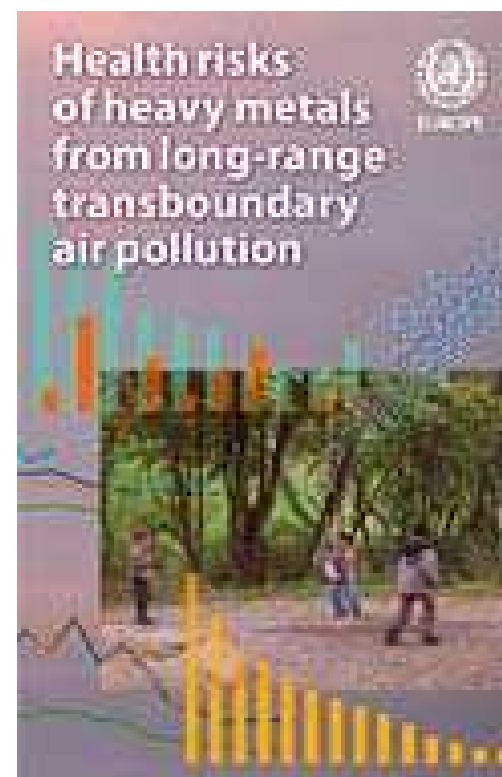
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Health Risks of Heavy Metals from Long-Range Transboundary Air Pollution

(joint WHO/UNECE Convention Task Force on Health Aspects of Long-range Transboundary Air Pollution)

http://www.who.int/phe/health_topics/outdoorair_aqg/en/index.html





WHO Policy –Mercury in Health Care

WHO recognizes the contribution made through the healthcare sector and therefore proposes to work with countries through the following strategies

- Short- term
- Medium-term
- Long-term

Short-term Strategies

- Develop clean up and waste handling procedures
- Procedures to include
 - spill clean up response,
 - educational programs
 - protective gear
 - waste storage containment
 - staff training

Countries to initiate phasing out process



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Medium term

- Inventorying usage of mercury
- Items to be categorized into immediate replaceable and gradually replaceable
- Replaceable devices to be handed back to the manufacturer
- Bring into effect the global multi lateral environmental agreements
- Ensure support to countries so that recovered mercury equipments are not pushed back in supply chain

Long term

- Support for ban of use of mercury devices
- Support in developing & implementing national plan, policies & legislation on mercury
- Support allocation of human and financial resources
- Promoting principles of UN Basel Convention



Implementing the policy

- **World Health Assembly**
- **WHO regional and national offices**
- **Health Care Waste Management: WHO - Health Care Without Harm, Global Environmental Facility project (GEF) - 2007 / 2011**

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WHO Guidance Values - Provisional tolerable weekly intake

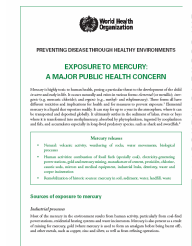
- In 2004 the Joint FAO/WHO (JECFA) established a tolerable intake of $1.6 \mu\text{g/kg}$ bodyweight per week for methylmercury in order to protect the developing fetus from neurotoxic effects.
- In 2006, JECFA clarified that life-stages other than the embryo and fetus may be less sensitive to the adverse effects of methylmercury. For adults, up to about twice the tolerable intake per week would not pose any risk of neurotoxicity.
- However available data did not allow firm conclusions to be drawn for children (up to about 17 years), as they may be more sensitive than adults. Hence the tolerable intake established in 2004 applies also to children.

WHO Recommendations

National, regional and global actions, both immediate and long-term, are needed to reduce or eliminate releases of mercury and its compounds to the environment.

WHO is committed to work with the health sector and national, regional and global health partners to:

- reduce mercury exposure;
- eliminate the use of mercury wherever possible;
- promote the development of alternatives to the
- use of mercury.



Elimination of Mercury-related Diseases

Targeted actions are required to:

- Conduct national assessments of mercury usage and disposal
- Implement educational activities for the health, environment and other sectors
- Promote the use of mercury-free alternatives
- Promote environmentally sound management of health-related waste containing mercury (as set out in the UN Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal)

Elimination of Mercury-related Diseases

Targeted actions are required to:

- Engage the health sector in dealing with mercury-containing material, health-care waste and emission reduction;
- Promote effective ways to control mercury emissions from cremation

Elimination of Mercury-related Diseases

Targeted actions are required to:

- Encourage international agencies to work with manufacturers, wholesalers and retailers to develop and make widely available inexpensive mercury-free products, and facilitate their procurement.
- Identify traditional practices, folk medicines and cosmetics involving mercury, and disseminate information on mercury hazards, exposure prevention and how to clean up spillages
- Promote long-term monitoring (including biological measurements of exposure) and programmes to reduce occupational exposure.

UNIDO-Global Mercury Project

- Six countries: Brazil, Lao PDR, Indonesia, Sudan, Tanzania and Zimbabwe

The GMP aims

- to introduce cleaner technologies,
- train miners,
- develop regulatory mechanisms and capacities within Government,
- conduct environmental and health assessments (E&HA) and
- build capacity within participating countries which will continue monitoring Hg pollution after the project.





EU Community Strategy Concerning Mercury

The commission strategy proposes a series of actions to cut EU and global emissions and use of mercury, including phasing out EU mercury exports by 2011.

It also addresses safe storage of mercury decommissioned by EU industry.

EU Community Strategy Concerning Mercury

The strategy has the following objectives:

- Reducing mercury **emissions**.
- Reducing the entry into circulation of mercury in society by cutting **supply** and **demand**.
- Resolving the long-term fate of mercury **surpluses** and societal **reservoirs** (in products still in use or in storage).
- Protecting against mercury **exposure**.
- Improving **understanding** of the mercury problem and its solutions.
- Supporting and promoting **international action** on mercury.



EU Community Strategy Concerning Mercury

Globally, there are continuing high levels of mercury demand – for which the EU is presently the main supplier.

The strategy, sets out a series of actions and targets banning mercury exports by 2011



Rotterdam Convention-PIC

Mercury compounds used as pesticides are subject to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

This is implemented in the Community by Regulation (EC) No. 304/20038, which also bans export of cosmetic soaps containing mercury and requires export notification of mercury compounds for all other uses.