

# IFCS FORUM V – SIDE EVENT ON HEAVY METALS

Hosted by the Swiss Confederation

23 September 2006 – Budapest, Hungary

**Health and environmental concerns  
associated with heavy metals:**

***Global needs for further action?***



**ACTIVITIES DEVELOPED  
AND PROMOTED BY WHO**

***Dr. J. Pronczuk***

***International Programme on Chemical Safety***

***Public Health and the Environment***

***World Health Organization***

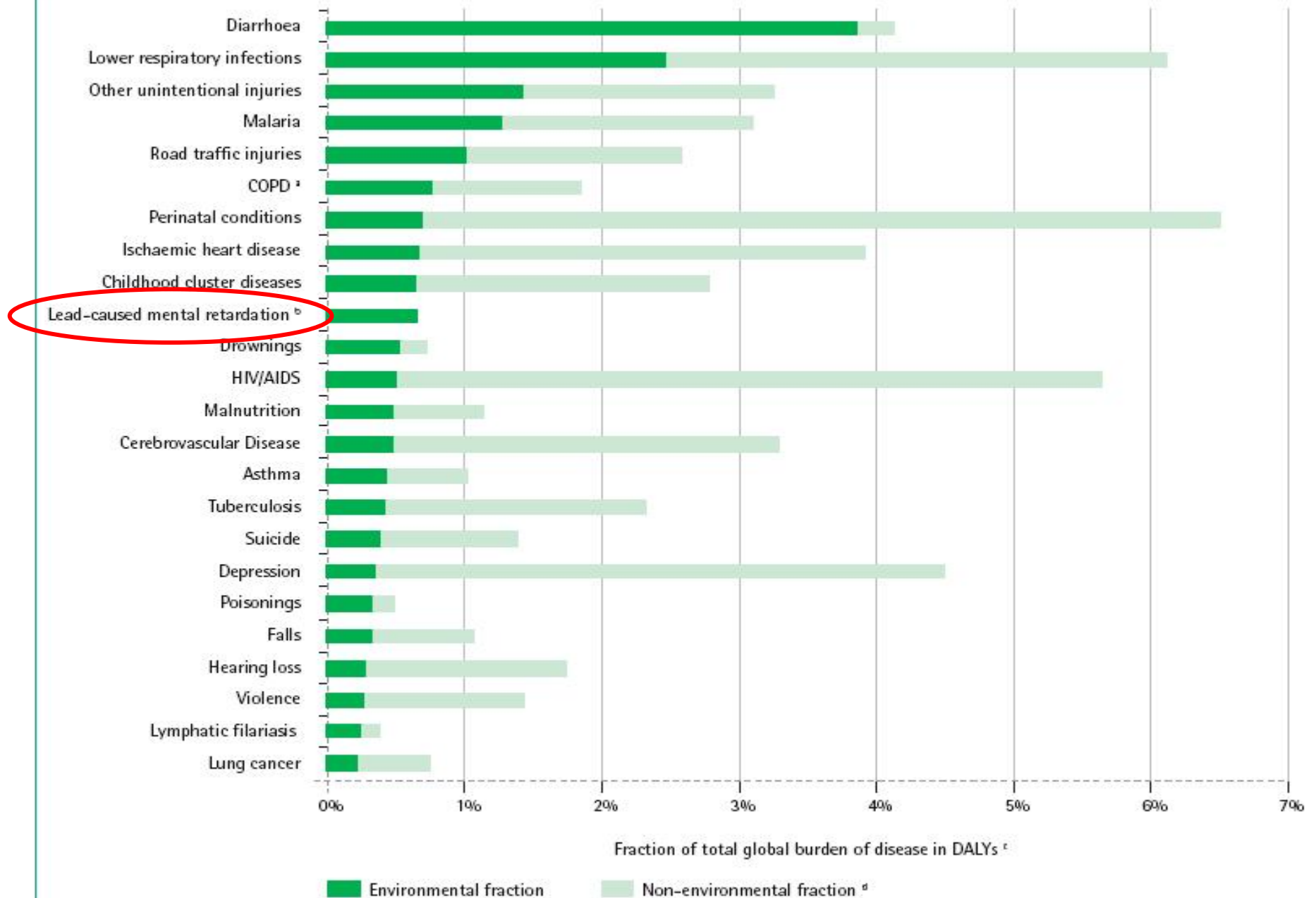
## HEALTH, ENVIRONMENT, HEAVY METALS – ACTIVITIES OF WHO

Exposure to metals through contaminated air, food and beverages, drinking water, or soil and objects/commodities:

### *A threat to human health and development*

- ❑ New evidence on adverse effects, developmental and aging processes
- ❑ New study methodologies identify immune, nephrotoxic, neurodevelopmental, reproductive, genotoxic and other effects.
- ❑ Capacity to induce effects early in life with significant consequences later on

## DISEASES WITH THE LARGEST ENVIRONMENTAL CONTRIBUTION



## SOME SPECIAL CONCERNS

*Lead exposure during early brain development and consequences early and later in life*

*Lead is a multi-organ-system toxicant and exposure is linked to a wide variety of effects - some of which have large public health implications (high blood pressure, cataracts, lowering of the IQ,...)*

*Maternal exposure to Cd is linked to early delivery, lower birth weight and its developmental consequences.*

*Methyl Hg as a high risk to the fetus in populations with high fish consumption.*

Particular susceptibility of fetus/small children during "critical windows of vulnerability" and due to biological and behavioural factors that magnify environmental exposures causing important health and developmental effects

## Health, environment, heavy metals - WHO Activities

WHO - international UN agency responsible for health.



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

## Health, environment, heavy metals - WHO Activities

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Through WHO, governments can jointly tackle global health problems and improve people's well being.

193 countries and two associate members

Staff public health experts and a wide variety of professionals in 147 country offices, 6 regional offices and at HQ in Geneva

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

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

### **Department on Public Health and Environment (PHE)**

Helps member states to:

- achieve safe, sustainable & health-enhancing human environments
- protected from biological, *chemical* and physical hazards
- secure from adverse effects of global & local environmental threats.

Incorporates the health dimensions into regional and global policies on health and environment, into national development policies and action plans for environment and health, including legal and regulatory frameworks for the management of the human environment.

# Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease

*How much disease could we prevent through better management of our environment?*

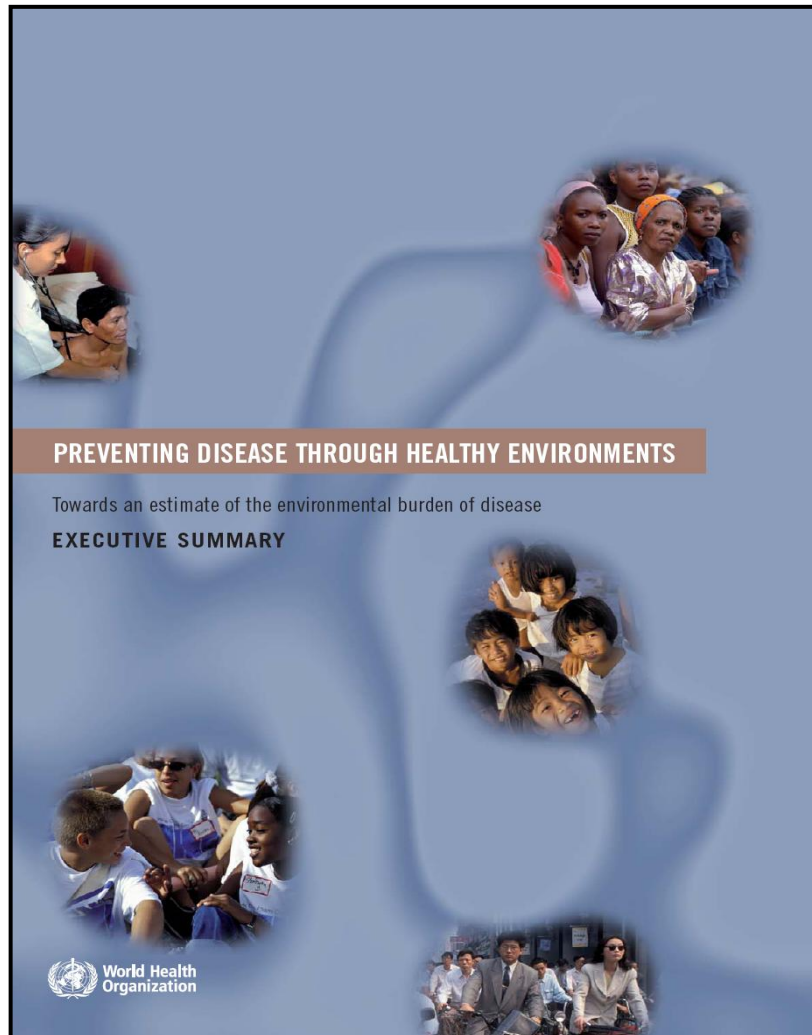
Environmental risk factors play a role in over than 80% of the diseases reported by WHO

In children, the environment can account for over 1/3 of the disease burden

- 24% of the global disease burden  
*(healthy life years lost)*

- 23% of all deaths attributable to environmental factors

In developing regions: 25%  
In industrialized regions: 17%  
In children 0-14 years: 36%



## Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease

*How much disease could we prevent through better management of our environment?*



A child directly exposed to tailpipe emissions from an automobile, which may heighten environmental exposure to lead in countries where leaded gasoline has not yet been phased out.

Credit: Harmut Schwarzbach/Still Pictures

In 2000, about 800 000 children were affected by lead exposure, leading to lower IQ and potential mild mental retardation.

*Important policy implications:*

*Environmental risk factors can be modified through cost-effective interventions, especially if international agreements provide support for such actions.*

## Health, environment, heavy metals - WHO Activities

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A large number of activities developed by WHO in relation to heavy metals in the environment and human health.

### **International Programme on Chemical Safety (IPCS)**

*Leading role in the preparation of risk assessment and other publications on Pb, Hg and methylHg and Cd*

- Concise International Chemical Assessment Documents (CICADS)
- International Chemical Safety Cards (ICSCs),
- Poisons Information Monographs (PIMs)
- Guidelines on the prevention and management of human exposure
- Environmental Health Criteria (EHC) Monographs

*Risk assessment of children's exposure to chemicals*

IPCS International Programme on Chemical Safety

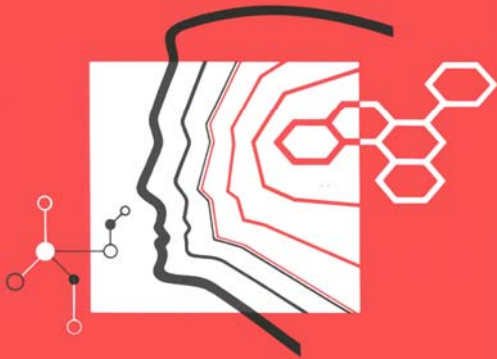
*Environmental Health  
Criteria 85*

Lead –  
Environmental Aspects

**IPCS**

INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY

Environmental Health Criteria 165  
Inorganic Lead



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the International Labour Organisation, and the World Health Organization.

WORLD HEALTH ORGANIZATION

**IPCS**

INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY

Environmental Health Criteria 134  
Cadmium



**IPCS**

INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY

Environmental Health Criteria 135  
Cadmium - Environmental  
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WORLD HEALTH ORGANIZATION

Risk  
assessment  
of children's  
exposure to  
chemicals -

## Health, environment, heavy metals - WHO Activities

### Joint FAO/WHO Expert Committee on Food Additives (JECFA)

Independent international scientific advice on food additives, food contaminants and veterinary drug residues in food.

*Lead, mercury, methylmercury and cadmium* were evaluated and tolerable intake values established

***Provisional Tolerable Weekly Intake (PTWIs):  
amount of the contaminant that can be consumed  
over life-time without appreciable health risk.***

**Methylmercury – (1.6 microg/kg bw/week)** recently re-evaluated, detailed guidance provided for risk managers re-susceptible sub-groups (developing fetus, children).

**Lead – (25 microg/kg bw/week)** a quantitative exposure model developed allows to evaluate effects on planned interventions in relation to food and drinking water.

**Cadmium – (7 microg/kg bw/week)** impact of different regulatory limits in various food commodities on human exposure and health has been re-evaluated.

## Health, environment, heavy metals - WHO Activities

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Technical programmes within PHE in charge of:

- **Drinking Water Quality Guidelines**
- **Air Quality Guidelines**
- **Mercury in Health Care** (policy paper)

**Lead:**

**Assessing the environmental burden of disease at national and local levels.**

*Highlights the magnitude of a disease burden that could be avoided, stressing the importance of evaluating the potential IQ loss and proposing tools that may be used for policy action to reduce the exposure to lead.*

## Children's Health and Environment activities

- Awareness raising
- **Training Modules** on the diagnosis, prevention, assessment and management of children's exposure to heavy metals

### **Fetal/Environmental Origins of Disease**

- **Promotion of collaborative international research: long term studies**



## Activities in Regional Offices

### **SOUTH EAST ASIA REGIONAL OFFICE (SEARO)**

**Interregional Workshop on the Environmental Health Impacts from Exposure to Metals (June 2005, Simla, India) – a concrete plan of action for the region.**

**Regional Training Programme: Sound Management of Health Care Waste (incl. Hg-containing waste) - India, Indonesia, Nepal, Maldives, Bhutan, Bangladesh with support of Global Alliance Vaccines Immunization**

### **EASTERN AND MIDDLE EAST REGIONAL OFFICE (EMRO)**

**Effect of Lead Smelters on the Environment and the People Living in the Vicinities (1999) – air/soil/drinking-water monitoring and blood lead levels around smelting and battery plants, concrete recommendations**

**Review of the Literature on Healthy Environments for Children in the EMRO: Status of Childhood Lead Exposure (2005)**

## Health, environment, heavy metals - WHO Activities

### International Agency for Registry of Cancer (IARC)

WHO agency (Lyon, France) - **IARC Monographs**

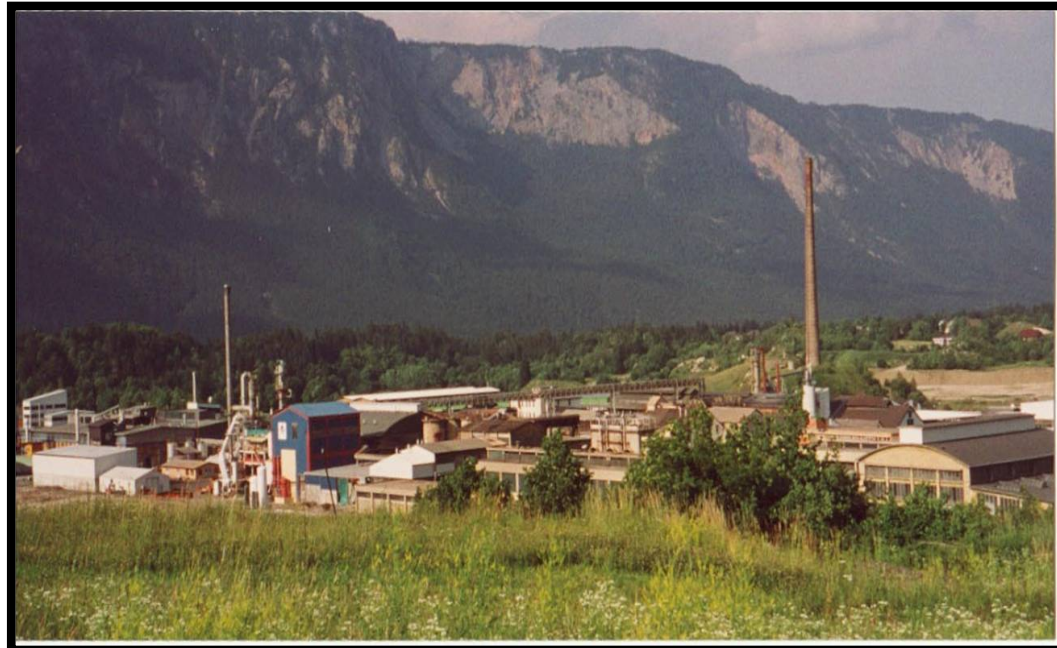
- Inorganic lead compounds: *probably carcinogenic to humans (Group 2A)*
- Organic lead compounds: *not classifiable as to their carcinogenicity to humans (Group 3)*
- Methylmercury compounds: *possibly carcinogenic to humans (Group 2B)*
- Metallic mercury/inorganic mercury compounds: *not classifiable as to their carcinogenicity to humans (Group 3)*
- Cadmium /cadmium compounds: *carcinogenic to humans (Group 1)*

# Health, environment, heavy metals - WHO Activities

## WHO's response to specific requests from Member States

Review of existing data and current literature, provision of guidelines, preparation of a basic study protocols, contacts with experts.

- ***...research study on lead in soil and human health***
- ***how to address the concern raised by Hg derivatives in vaccines***
- ***how to deal with the issue of mercury in dental amalgams, vaccines or hair & skin cosmetics.***



## Health, environment, heavy metals - WHO Activities

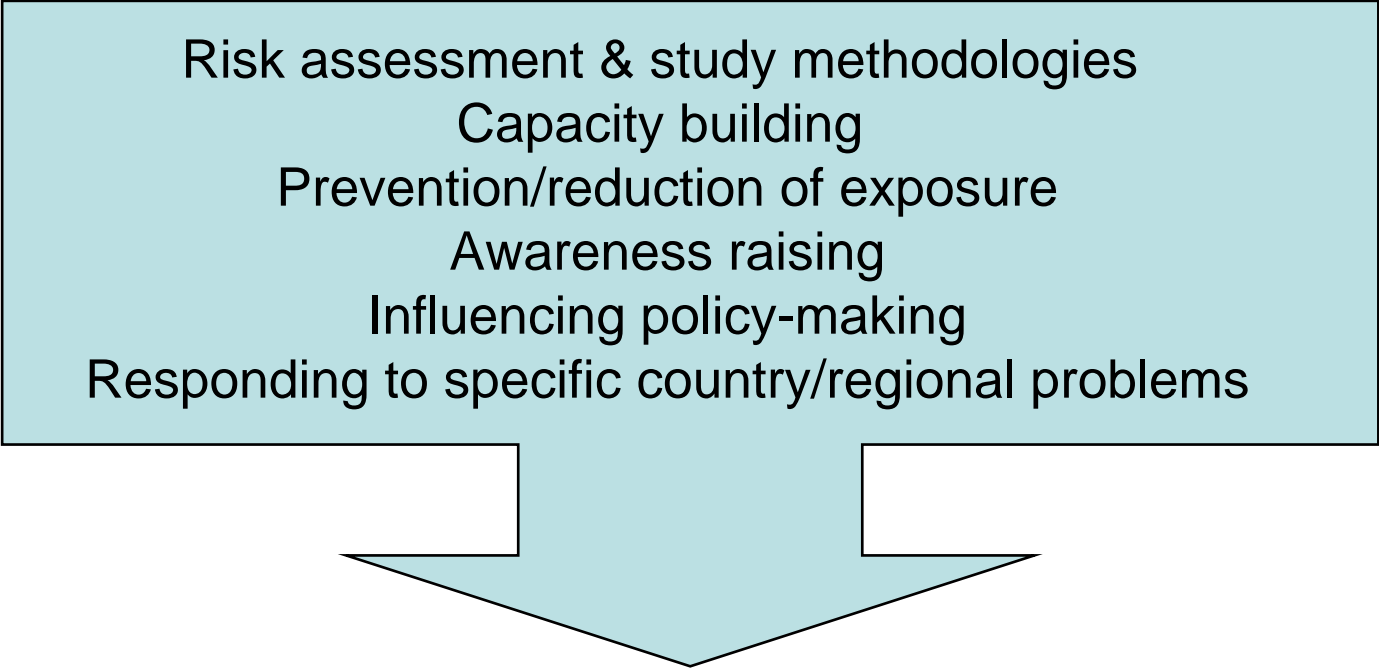
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### Activities promote:

- Cooperative research efforts: scientists from developing and industrialized countries sharing common interests work using agreed protocols
- Technology/methodology transfer – and improved capacities
- Networks of trained scientific collaborators from different parts of the world
- Close and fast contacts with specialized centres, scientific bodies, NGOs
- Policy changes

*Presence of WHO in a large number of countries facilitates both the dissemination and collection of relevant public health and environmental information, the implementation of activities and the response to international agreements and conventions.*

## Health, environment, heavy metals - WHO Activities



Risk assessment & study methodologies  
Capacity building  
Prevention/reduction of exposure  
Awareness raising  
Influencing policy-making  
Responding to specific country/regional problems

Remarkable wealth of knowledge, experience and contacts

Professional groups established – a strong scientific support the organization and a network with great potential for international activities.



### Areas for future action

1. Periodical updating of existing documents on the basis of new information
2. Strengthening the training, information and capacity building efforts
3. Promoting further cooperative research efforts  
*e.g. markers of exposure, effect & susceptibility to Pb, Hg, Cd;  
longitudinal cohort studies*
4. Accelerating actions towards implementation of existing policies and international agreements

*How?* strengthening interactions with other organizations and sectors:  
environment, trade, education, industry

***Towards the protection of human health – and vulnerable groups – from Pb, Hg and Cd exposure, contributing to sustainable development through healthy people in healthy environments.***