

WHO Chemicals Safety - Activity Report 2009

This document presents a summary of WHO activities undertaken in 2009 which have contributed to the International Programme of Chemical Safety (IPCS).

It covers the following areas:

- (1) Applied Risk Assessment (including Concise International Chemical Assessment Documents (CICADs), International Chemical Safety Cards (ICSCs), Advocacy on Chemicals of Public Health Concern and the WHO Classification of Pesticides by Hazard.
- (2) Risk Assessment Methodology (including the IPCS Harmonization Project; Environmental Health Criteria Documents).
- (3) Poisons Prevention, Information and Management .
- (4) Environmental Emergencies.
- (5) Children's Environmental Health.
- (6) International Conventions and Agreements, including SAICM .
- (7) Capacity Building.

A list of IPCS publications is given in [Annex 1](#) and a list of IPCS Events in 2009 is given in [Annex 2](#) .

1. APPLIED RISK ASSESSMENT

1.1 Concise International Chemical Assessment Documents (CICADs) and other Risk Assessment Documents

In 2009, seven CICAD assessments were published. CICADs on ethoxyethanol, methoxyethanol and propoxyethanol were published on the web and will be printed as a compendium in 2010. CICADs on Iodine and Inorganic Iodides (CICAD No. 72), 2-Butenal (CICAD No. 74) (available in 2008 on the web only), Cyclic Acid Anhydrides (CICAD No. 75) and Trivalent Chromium Compounds (CICAD No. 76) were printed. The CICAD on Strontium and Strontium Compounds (CICAD No. 77) was finalized following additional consultation and is in the editing phase. The CICAD on Hexavalent Chromium (CICAD No. 78) requires consideration of new data and hence additional peer review before it can be finalized.

A regular progress report is updated on specific CICADs on the IPCS web site <http://www.who.int/ipcs/publications/cicad/progress/en/index.html>. The new publications were disseminated through the IPCS web site, direct mailing through to institutions worldwide, and the INCHEM web site, free-of-charge (<http://www.inchem.org>).



CICAD (No 67) Ethoxyethanol and Propoxyethanol

http://www.who.int/entity/ipcs/publications/cicad/ethoxy_propoxyethanol.pdf

**CICAD (No 67) Methoxyethanol**

<http://www.who.int/entity/ipcs/publications/cicad/methoxyethanol.pdf>

**CICAD (No 72) Iodine and Inorganic Iodides: Human Health Aspects**

<http://www.who.int/entity/ipcs/publications/cicad/cicad72.pdf>

**CICAD (No 74) 2-Butenal (Crotonaldehyde)**

<http://www.who.int/entity/ipcs/publications/cicad/cicad74.pdf>

**CICAD (No 75) Cyclic Acid Anhydrides: Human Health Aspects**

<http://www.who.int/entity/ipcs/publications/cicad/cicad75.pdf>

**CICAD (No 76) Trivalent Chromium Compounds**

<http://www.who.int/entity/ipcs/publications/cicad/cicad76.pdf>

Discussion at the CICAD Final Review Board meeting in March 2007 on the draft **DDT assessment** concluded that there was a need for additional work particularly to better characterize and understand sources and extent of exposure under conditions of use during indoor residual spraying for vector control. It was subsequently decided to complete the revised assessment in a number of steps. In 2009 an updated draft DDT Hazard Assessment was released for public and peer review, and subsequently considered at an expert meeting from 2-4 June, at WHO Headquarters in Geneva. In parallel, the WHO Pesticide Evaluation Scheme (WHOPES), in consultation with WHO/Chemical Safety, has led work to develop a generic model for the risk assessment of chemicals used in Indoor Residual Spraying (IRS). A generic model was considered at an expert meeting from 23-25 June, Helsinki, Finland, and subsequently employed in the preparation of the draft DDT Exposure Assessment. The draft DDT Exposure Assessment was prepared and released for public and peer review, and subsequently considered at an expert meeting from 15-16 December, Bradford, United Kingdom. In 2010 the hazard assessment and exposure assessment prepared during 2009 will be used to finalize the DDT Risk Assessment.

1.2 International Chemical Safety Cards (ICSCs)

The IPCS work on the International Chemical Safety Cards (ICSCs) continues to be one of the major points of collaboration with the International Labour Organization (ILO). ICSCs have been translated into 24 languages and are available on the Internet in 17 languages, through the ILO web site (www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm), the INCHEM Databank (www.inchem.org) and the web sites of participating institutions such as US NIOSH. In 2009, the average number of monthly downloads for the English versions of the Cards from the INCHEM web site was 61,700.

GHS classifications continue to be made for new and updated International Chemical Safety Cards (ICSCs). The corresponding hazard statements, signal words and symbols are included on the ICSCs. To date, GHS classifications have been included on 249 ICSCs.

Development work is nearly completed on a new ICSC database, which will be hosted on the ILO server. Production of ICSCs on the new database will start in 2010.

A total of 82 ICSCs were produced or fully revised in 2009. A further 67 ICSCs were updated using a fast-track procedure for dealing with minor corrections and updates to information that is regularly revised, such as Occupational Exposure Limits.

The ICSC Compiler's Guide which sets out the list of standard phrases on identity, hazardous effects and precautionary statements is continually updated by IPCS.



ICSC Compiler's Guide, November 2009

http://www.who.int/ipcs/publications/icsc/comp_guide.pdf

1.3 IPCS INCHEM web site (<http://www.inchem.org>)

This web site provides another mechanism to disseminate collections of risk assessment documents, free of charge to any user with access to the Internet. It is updated biannually to include all IPCS published documents. In 2009, there were more than 1.5 million unique visitors to the web site. The contents of the web site are also available through Phase 1 of the OECD eChemPortal.

1.4 Chemicals of Public Health Concern

The WHO Project on Chemicals of Public Health Concern was initiated in 2009. It aims to raise awareness, advocate for action, and facilitate access to tools for action on selected chemicals or groups of chemicals of major public health concern. These are: (a) arsenic; (b) asbestos; (c) benzene; (d) cadmium; (e) highly hazardous pesticides; (f) inadequate or excess fluoride intake; (g) lead; (h) mercury; (i) major air pollutants; and (j) polychlorinated dibenzodioxins and dioxin-like compounds. The primary target group is decision-makers from WHO Member States.

Project outputs include for each chemical/group of chemicals: (i) a compilation of most relevant WHO material related to risk assessment, burden of disease, norms and guidance values, tools for action, education material; and (ii) a short information document providing an overview and summary of WHO's position, guidance and recommendations with regards to risk assessment and management. An additional output consists in an estimate of the global burden of disease attributable to these chemicals or groups of chemicals, which will be published in peer-reviewed literature as appropriate.

Draft documents were developed and reviewed in 2009, including during a two-day expert meeting that took place in WHO Headquarters in Geneva on 3-4 December. In addition, the meeting also reviewed and identified information gaps in existing WHO material on the chemicals addressed, and made recommendations for further work to fill them.

The meeting report and short information documents will be finalized in early 2010 and brought to the attention of WHO Member States during the 2010 World Health Assembly, supported by relevant advocacy and communication material. All documents will also be made publicly available on the IPCS web site at <http://www.who.int/ipcs/en/>.

1.5 Classification of Pesticides by Hazard

The WHO Recommended Classification of Pesticides by Hazard was first published in 1975, and has been revised and reissued with new and updated information every few years. This WHO publication has gained wide international acceptance, in particular among developing countries. During 2009 work was undertaken to update this publication with new information.

In addition, for this revision the classification scheme has been updated to align the WHO scheme with the Globally Harmonized System for Classification and Labelling (GHS) as the starting point for allocating pesticides to a Hazard Class. This proposal to revise the classification scheme was presented to the Third FAO/WHO Joint Meeting on Pesticide Management and the revisions are in-line with the recommendations of the Joint Meeting. Publication of this update (on the internet and in print form) is anticipated early in 2010.

1.6 Food Safety-related assessments

In mid-2008 the JECFA and JMPR programme was moved from the Department of Public Health and Environment to the Department of Food Safety and Zoonoses (FOS), hence food safety-related chemical assessments are carried out in FOS.

Evaluations of the FAO/WHO Joint Expert Committee on Food Additives are available free-of-charge on the IPCS web site <http://www.who.int/ipcs/publications/jecfa/en/>; toxicological monographs are also available on the INCHEM web site (<http://www.inchem.org>).

Evaluations of the FAO/WHO Joint Meeting on Pesticide Residues are available free-of-charge on the IPCS web site <http://www.who.int/ipcs/publications/jmpr/en/> and also the INCHEM web site.

2. RISK ASSESSMENT METHODOLOGY

2.1 The WHO/IPCS Harmonization Project

The IPCS “*Project on the Harmonization of Approaches to the Assessment of Risk from Exposure to Chemicals*” (commonly referred to as the “Harmonization Project”) aims to harmonize global approaches to risk assessment through both increased understanding and agreement on basic principles, and to develop international guidance documents on specific issues.

The Project has a global Steering Committee, which includes experts drawn from national risk assessment agencies, representatives of supra-national bodies (such as the EU (ECB/JRC), EFSA, and the OECD), and representatives of non-governmental organizations in official relations with WHO, and working in the field of chemical risk assessment (ECETOC and ILSI/RSI). The Steering Committee meets every 2-3 years to recommend the Project workplan.

In 2009, a number of activities in the workplan were implemented. The Harmonization Project web site (<http://www.who.int/ipcs/methods/harmonization/en/index.html>) contains, inter alia, both the current Project workplan and Brochure (<http://www.who.int/entity/ipcs/methods/harmonization/brochure2007.pdf>).

Harmonization Project publications continue to be taken up across the range of assessment sectors, i.e. industrial chemicals, biocides, pesticides, veterinary products, pharmaceuticals, occupational and public health, and are known to be used by many national and supra-national risk assessment bodies, e.g. Australia, EFSA, the European Union, Canada, Japan, OECD, UNECE (GHS guidance), United Kingdom, and the United States.

A summary report on workplan activities in 2009 follows:

- **Combined Exposures (Aggregate/cumulative Risk Assessment).** The objective of this activity is to develop a framework for assessing the combined risk from exposure

to one or more agents via all relevant routes and pathways and to review approaches employed to date in different sectors (e.g., pesticides, industrial chemicals, therapeutics) and disciplines (e.g., consumer exposure, occupational exposure, environmental exposure). A draft Framework for Risk Assessment of Combined Exposures to Multiple Chemicals was released in mid-2009 for public and peer review. The framework is accompanied by two case studies illustrating its application. The Framework will be finalized following a Review Meeting scheduled for 18-19 February 2010, London, United Kingdom.

- **Exposure assessment.** The guidance document on “Data Quality in Chemical Exposure Assessment” was printed in 2009, along with the guidance on “Characterizing and Communicating Uncertainty in Exposure Assessment” (Harmonization Project Document No. 6, available on the internet since 2008). A Continuing Education Course on Human Exposure Assessment, focussing on WHO/IPCS Harmonization Guidance, was delivered at EUTOTOX2009, in Dresden, Germany. The guidance on uncertainty in exposure assessment was presented at SRA (Europe) and SRA (North America) annual conferences by experts who participated in the development of the guidance.
- **Mutagenicity Testing for Chemical Risk Assessment.** The 1996 IPCS Qualitative Scheme for Mutagenicity Testing was updated and published as “Mutagenicity Testing for Chemical Risk Assessment” in the journal *Mutagenesis* and is available on-line.
- **Development of Harmonized Guidance for Immunotoxicity Risk Assessment.** Harmonized guidance on Immunotoxicity Risk Assessment is being developed. A meeting to agree the draft document took place at RIVM, Bilthoven, Netherlands, on 27-29 April 2009. This activity builds on the WHO/IPCS Environmental Health Criteria documents on immunotoxicology. Work commenced on a series of case studies to illustrate the guidance. Both the draft guidance and the case studies are scheduled for release for public and peer review in 2010.
- **Principles of Characterizing and Applying PBPK Models in risk assessment.** Following public and peer review of the draft guidance document, an international workshop was convened 6-8 July, in Berlin, Germany to further consider and test the draft using a series of case studies. Over the second half of 2009, the recommendations of the workshop were implemented in a revised document, scheduled for publication in 2010. A WHO/IPCS symposium presenting the guidance document was delivered at EUROTOX 2009, in Dresden, Germany.
- **Human Health Risk Assessment Toolkit (HHRA Toolkit)** delivers practical tools for risk assessment in a user-friendly format, in particular for developing countries and countries with economies in transition. The Toolkit provides "road maps" (step-by-step), including addressing common risk assessment problems, together with illustrative case examples. During 2009 the draft HHRA Toolkit was pilot tested in three Asian countries: Thailand, Malaysia, and China. A meeting to introduce the pilot phase was held at the Chulabhorn Research Institute, Bangkok, Thailand, 30-31 July. The meeting was attended by 20 risk assessment experts from the pilot countries, WHO and UNEP. Following the pilot phase and peer-review, a final face-to-face toolkit review meeting was held at the WHO Office, Lyon, France, 29-30 October. The meeting discussed the experience gained from the pilot phase as well as the comments received from the peer-review, and provided recommendations for finalizing the toolkit. The global review meeting was attended by 15 risk assessment experts from developed and developing countries. The HHRA Toolkit

will be released in final form early 2010. The focus of the WHO HHRA Toolkit is on assessing human health risks of chemicals. This makes it complementary to current developments by other international organizations that are compiling resources and tools for Environmental Risk Assessment of Chemicals (OECD) and the environmental assessment and management of pesticides (UNEP).

- **Identifying Early Life Stages for Characterizing Chemical Exposures.** An international symposium is being planned, which will discuss work to date and the state-of-the-science in order to inform the development of a practical tool for countries to explicitly consider early life stages in chemical risk assessment. This would address physiological and behavioural factors, windows of susceptibility, translate emerging science, provide practical criteria/guidance for factoring in life stage and make use of illustrative case studies. A planning group met from 23-24 March 2009, Washington, D.C., United States to develop the symposium programme and commence preparation of documents. The symposium is planned for 2010.
- **Guidance on Interpreting Effects that may be modest or adaptive.** The development of a thought-starter on the interpretation of effects that may be modest or adaptive continued in 2009. The Fraunhofer Institute, Hanover, is preparing the first draft.
- **Probabilistic Hazard Assessment.** The development of the thought-starter on this topic progressed during 2009 under the joint authorship of experts from the US EPA and RIVM, Netherlands. The document is nearing completion and will be considered at an expert meeting, to be scheduled for 2010.
- **Reproductive and developmental toxicity.** Development of harmonized morphological terms (by the WHO Collaborating Centre on Developmental Toxicology in Berlin). This activity continues to progress with regular Expert Workshops.
- A WHO/OECD **Risk Assessment Workshop** was delivered to individuals involved in OECD expert groups, from 2-3 November, Paris. The workshop was attended by 31 participants from 14 countries, the EC, EFSA, ECHA, International Council on Animal Protection in OECD Programmes, BASF and BIAC. Participants considered the implications of systematic evaluation of modes of action for dose-response response extrapolation in risk characterization. Also considered were implications for toxicity testing in relation to OECD Test Guidelines and testing strategies, to better incorporate mechanistic information, and the integration of all available information including QSARs. The outcomes of the discussions will be presented to the OECD Joint Meeting in February 2010.

New publications issued in 2009:



Framework for the Risk Assessment of Combined Exposures to Multiple Chemicals (Draft for public and peer review)

http://www.who.int/entity/ipcs/methods/harmonization/areas/combined_exposure/en/index.html



Mutagenicity Testing for Chemical Risk Assessment: Update of the WHO/IPCS Harmonized Scheme.

<http://mutage.oxfordjournals.org/cgi/content/full/gep014?ijkey=Tu0KSLJmMJoa9J&keytype=ref>



Final draft WHO Human Health Risk Assessment Toolkit (The draft toolkit is available upon request. The final toolkit will be published in early 2010).



The Harmonization Project Newsletter was published in December. See <http://www.who.int/ipcs/methods/harmonization/en/index.html>

2.2. Environmental Health Criteria (EHC) and Other Methodology Documents

In 2009, Environmental Health Criteria 239 Principles for Modelling Dose-Response for the Risk Assessment of Chemicals was published. A further two EHC documents were in preparation, i.e.: Dermal Exposure (first draft being prepared by the Fraunhofer Institute, Hanover); and the EHC on updating methodologies for the risk assessment of chemicals in food (in press).



EHC 239 Principles for Modelling Dose-Response for the Risk Assessment of Chemicals

http://whqlibdoc.who.int/publications/2009/9789241572392_eng.pdf

All EHC publications are available free-of-charge on the IPCS web site <http://www.who.int/ipcs/publications/ehc/en/index.html> and the INCHEM web site <http://www.inchem.org>.

Work commenced to prepare a WHOPES/IPCS risk assessment model for aircraft disinsection. Ultimately this project aims to review the public health risks associated with chemicals proposed for aircraft disinsection and develop a list of WHO recommended chemicals. This aims to assist Member States to implement the International Health Regulations (2005), Annex 5 Specific Measures for Vector-Borne Diseases, which states that where there are methods and materials advised by WHO for disinsection, these should be employed. The current WHO recommendations date from 1995. They are adopted by many countries. However, WHO has been requested to consider newer, and possibly less hazardous formulations for this purpose. The first stage of the project involves the development of a risk assessment model.

3. POISONS PREVENTION, INFORMATION AND MANAGEMENT

3.1 Poisons Information and Management

IPCS provided membership of the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT) or the American Academy of Clinical Toxicology (AACT) to individuals working at 17 poisons centres in developing countries. Membership benefits include a subscription to the journal Clinical Toxicology and a monthly current awareness bulletin on toxicology, both of which are intended as general resources for the poisons centre.

The individuals provided with membership also benefit from reduced registration fees to scientific congresses of the associations.

IPCS has worked with WHO colleagues on the development of a manual for district clinicians in low-resource settings, called the IMAI District Clinical Manual: Hospital Care for Adolescents and Adults. This includes a comprehensive section on poisoning which has been written and reviewed by an international group of clinical toxicologists. The manual is currently undergoing field-testing in 8 countries.

3.2. Network of poisons centres and INTOX

Fourteen subscriptions to the INTOX Data Management System were provided to poisons centres in developing countries and countries with economies in transition. At present, 18 poisons centres are using the system. The system has recently been translated into Russian in response to interest in its use expressed by countries from the Commonwealth of Independent States.

The INTOX General network provides a shared pool of knowledge for mutual assistance. It currently comprises over 200 members from toxicology centres in over 50 countries. In 2009, nine requests for assistance with toxicological problems were dealt with through the network.

A global survey was carried out in 2009 to establish which countries currently have poisons centres and to find out details of the operations and resources of existing centres. Data analysis is underway and a report will be prepared in 2010.

4. CHEMICAL INCIDENTS AND EMERGENCIES

A total of 256 chemical incidents of potential public health concern were detected in 2009 through daily screening of global public health intelligence, including GPHIN, ProMed, WHO sources, and external sources. All events detected were reviewed and their public health risks assessed. In 48 cases, information was disseminated to relevant counterparts and partners for further action. Significant support was provided in 8 events, through the provision of technical advice, the identification of relevant expertise and arranging for analytical toxicology support.

In the last quarter of 2009 WHO implemented an organization-wide event management system for documenting and tracking WHO response to public health events caused by all hazards including chemicals. This system will promote a standardized approach to such incidents, and supports WHO obligations under the International Health Regulations (2005) to assist countries to deal with public health events of potential international importance.

WHO Global Chemical Incident Emergency Response Network (ChemiNet) was maintained and further strengthened through the identification of additional supporting institutions, laboratories and experts. The structure and scope of ChemiNet is described on the WHO environmental health in emergencies web site:

http://www.who.int/environmental_health_emergencies/ChemiNet3.pdf

In 2009, the Manual for the Public Health Management of Chemical Incidents and Emergencies was finalized and published. Activities were initiated to develop training material and a training course based on the manual, including technical lectures and case studies. Draft training material was discussed at a meeting that was held in conjunction with the 7th Conference of Toxicology in Developing Countries, Sun City, South Africa, 6 September.



WHO Manual for the Public Health Management of Chemical Incidents

http://www.who.int/environmental_health_emergencies/publications/Manual_Chemical_Incidents/en/index.html

A presentation was delivered on the role of public health in the management of chemical incidents and emergencies, International Conference on Chemical (Industrial) Disaster Management, New Delhi, India, 11-13 February.

A presentation was delivered providing information from the WHO Chemical Incident Alert and Response system on events related to articles, Informal Workshop on Stakeholders' Information Needs on Chemicals in Articles/Products, UNEP, 9-12 February 2009, Geneva, Switzerland

A Joint WHO/UNEP side event on *Chemical Incidents, Accidents and Emergencies: New Guidelines and Tools from International Organizations* was held, 13 May 2009, at the International Conference on Chemicals Management, (ICCM2), Geneva, 11-15 May 2009. The event raised awareness in SAICM delegates about the need to strengthen capacities in countries for health and environmental aspects of chemical incidents and emergencies, including the need for cooperation and coordination among all relevant sectors (e.g. health, environment, civil protection, etc.). Case studies of chemical incidents in developed and developing countries were presented that required a profound public health and environment response (e.g. United Kingdom and Mongolia). In addition, the event was used to promote the use of the WHO Manual for the Public Health Management of Chemical Incidents and Emergencies.

In 2009, activities were undertaken in support of the implementation of the International Health Regulations (IHR2005), including technical contributions to the development of two WHO draft documents (See also Section 6 of this report).

Regular coordination meetings were attended with partners involved in the prevention and management of chemical incidents and emergencies, including with the OECD Working Group on Chemical Accidents, the Global Health Security Initiative (GHSI) and its Working Group on Chemical Events, UNEP/OCHA, UNEP, and relevant NGOs.

5. CHILDREN AND CHEMICALS

5.1 The 3rd International WHO Conference on Children's Health and the Environment

The 3rd International WHO Conference on Children's Health and the Environment: from Research and Knowledge to Policy and Action, was hosted by the Ministry of Environment in Busan, Republic of Korea (7-10 June 2009) in collaboration with the Korean Ministry of Health and of Social Welfare and Family Planning jointly with WHO and national and international partners. The event aimed at extending the recognition of children's environmental health needs and providing a platform for the exchange of scientific experiences, for learning about research efforts, and promoting protective policies. The conference programme consisted of 8 Plenary Sessions and one Round Table, 10 Thematic Sessions (breakout groups), 6 Setting Sessions (breakout groups) and a Special Session on Asbestos. Delegates were exposed to over 250 oral or poster presentations during the four-day event. Chemical issues were discussed throughout the event, with specific sessions on lead, mercury, POPs and endocrine disruptors, among others.

On Sunday 7 June, 11 pre-conference events took place, including a one day workshop aimed at expanding and encouraging dialogue between Children's Environmental Health (CEH) professionals and the media, and two CEH Training workshops: a paediatric CEH training workshop sponsored by the Korean Paediatric Society and the International Paediatric Association and a separate workshop for early childhood educators sponsored by the Korean Society of Early Childhood Education (with over 300 participants). Policy strategies were also discussed. On Wednesday 10 June, the conference concluded with the presentation of The Busan Pledge for Action – a pledge to promote the protection of Children's Environmental Health. This pledge outlines the future goals of the stakeholders, and will serve as a basis for further action to prevent environmental contamination and improve children's health.

The four day event brought together over 600 participants from over 60 countries and over 30 different organizations. The host nation was joined by WHO and UNEP officials as well as international organizations and non-governmental organizations (NGOs), environmental and health researchers, academics and experts studying different critical issues in CEH. This fusion of diverse professional and cultural backgrounds provided delegates the opportunity to discuss why existing global efforts have not progressed more rapidly and what needs to be done, both in developing and industrialized countries.

Based on the Busan Pledge and Conference, a new global action plan on children's environmental health was drafted and is being circulated to key stakeholders. The full report of the conference, including the preconference events, the side-meeting of NGOs and the community event (with over 10,000 local participants) is available at www.who.int/ceh. The approved and edited Busan Pledge for action is also available at the CEH website www.who.int/ceh) and was sent as background material for the upcoming Fifth Ministerial Conference on Environment and Health (Parma, Italy 10-12 March 2010), which will focus on child health in a changing world.



3rd International WHO Conference on Environmental Threats to the Health of Children: Meeting Report - <http://www.who.int/ceh/en/>

5.2 Training package on children's environmental health (CEH)

The training package on children's environmental health was used for the implementation of capacity building activities in several countries by different collaborators. Some modules are available online and can be accessed by a wide audience at http://www.who.int/ceh/capacity/training_modules/en/index.html. PowerPoint versions of the modules can also be requested at the same link.

In 2009, the training modules focusing on reproductive health were used in the WHO Training Course on Reproductive Health, WHO/HQ, Geneva, Switzerland (February 2009). There was a highly successful CEH training workshop during the 3rd WHO International CEH Conference, sponsored by the Korean Paediatric Society and the International Paediatric Association. Over 150 participants attended and received the handbook and a CD with the WHO Training Package, in English and partly in Korean.

5.3 Guide to undertaking a birth cohort study

The document "A guide to undertaking a birth cohort study: purposes, pitfalls and practicalities" was published in *Paediatric and Perinatal Epidemiology* as a supplement in July 2009. It has since then been used as the basis for many workshops/sessions on promoting long-term studies in children.

5.4 Information materials on heavy metals and children's health and development

Information materials on the effects of exposures to heavy metals (lead and mercury) on children's health and development and on the effects of exposures to persistent organic pollutants on children's health and development were developed and will be placed on the WHO web site in 2010.

5.5 Guidance materials on specialized children's environmental health centres

Guidance materials on specialized children's environmental health centres were developed and reviewed and are expected to be published in 2010.

6. IMPLEMENTATION OF INTERNATIONAL CONVENTIONS AND AGREEMENTS, INCLUDING SAICM

Activities in 2009 have focused on the GHS, the Rotterdam and Stockholm Conventions, SAICM, the International Health Regulations, and the IOMC, as outlined below.

Work to align relevant WHO instruments to the Globally Harmonized System for Classification and Labelling (the GHS) and to support health-sector participation. The work in 2009 focused on the system for International Chemical Safety Cards (ICSCs). GHS classifications have now been assigned to 249 chemicals. Updates on the work being undertaken by WHO to implement the GHS were provided to the UN Sub-Committee of Experts on the GHS (UNSCEGHS) as part of the work programme of the Sub-Committee for 2009. WHO staff have contributed to the work of a UNSCEGHS correspondence group on precautionary information. The classification scheme used for the WHO Recommended Classification of Pesticides by Hazard has been revised to align with the GHS acute toxicity hazard categories.

Improving notification of Severely Hazardous Pesticide Formulations under the Rotterdam Convention. A workshop was organized in collaboration with the Rotterdam Convention Secretariat in Dar es Salaam, Tanzania, on 22-25 June 2009 for representatives from Ghana and Tanzania. The purpose of the workshop was to improve capacity for identifying and notifying problems with severely hazardous pesticide formulations under the Rotterdam Convention. Participants were representatives from the ministries of health, agriculture and environment from the two countries, occupational and community health specialists, the Ghana poisons centre, representatives from NGOs, from the Rotterdam Convention Secretariat and FAO, and from the WHO staff at country, regional and headquarters level. Each country group developed a proposal for a small-scale project to test possible mechanisms for data collection in specific localities. WHO has provided seed funding for these projects, which will start in 2010.

Work with the Stockholm Convention POPs Review Committee to promote common principles and approaches in global risk assessment of chemicals. WHO staff presented the draft Framework for Risk Assessment of Combined Exposures to Multiple Chemicals to the 5th meeting of the Committee. The Committee agreed that the Intersessional Working Group on Toxicological Interactions would develop two case studies demonstrating the application of the Framework to assist the Committee in its future work.

Strengthening the support, awareness and the need for engagement of the health-sector in the Strategic Approach to International Chemicals Management (SAICM). The work in 2009 has continued to facilitate the engagement of the health-sector in SAICM implementation.

Work has focused on:

- Promoting an awareness of health-sector priorities and possibilities for engagement in SAICM implementation through participation in SAICM regional and sub-regional meetings. These have included the Second Asia-Pacific regional meeting on SAICM (Beijing, 23-24 November 2009), the Third Central and Eastern European meeting on SAICM (Lodz, Poland, 9-10 December 2009) and the Caribbean Workshop on SAICM and related chemicals and hazardous waste instruments (Barbados, 10 to 13 March 2009). Of particular relevance to discussions at these meetings have been regional initiatives on health and environment, notably the implementation of the workplan of the Thematic Working Group on Toxic Chemicals and Hazardous Substances of the Regional Forum on Environment and Health for South East and East Asia, preparations for the Fifth European Ministerial Conference on Environment and Health and the International Health Regulations (2005) as a means of improving health security for chemicals risks. WHO mobilized support from its regional, sub-regional and country offices for participation in these meetings. In addition and on behalf of the participating organizations of the Inter-Organization Programme for the Sound Management of Chemicals, the WHO Regional Office for Africa, participated in the African Core Group for SAICM (Nairobi, 20 to 21 August 2009).
- Participation as a member of the SAICM Quick Start Programme Executive Board (Geneva, 23 and 24 April 2009) and the SAICM Quick Start Programme Trust Fund Implementation Committee (Geneva, 16 and 17 April 2009 and Washington, 15 and 16 October 2009).
- Increasing awareness and understanding of SAICM and the availability of funding to support projects that support initial actions aimed at capacity-building for chemicals safety through participation in the 8th meeting for Global Collaborating Centres for Occupational Health (Geneva, Switzerland, 18 to 23 October 2009) and the North American Congress of Clinical Toxicology (San Antonio, United States, 21 to 26 September 2009).
- Technical advice for the development of successful project proposals under the SAICM Quick-Start Programme Country namely support for the Implementation of the Libreville Declaration on Health and Environment in Africa: Development of guidelines and capacity building for Situation Analysis and Needs Assessment in view of developing country plans for joint action (in Gabon and Kenya) and the development of a Pacific Islands Poisons Information Network (in the Cook Islands, Kiribati, Samoa, Solomon Islands and Tonga).
- Implementation of resolution II/4B of the International Conference on Chemicals Management on eliminating lead from paint and participation on behalf of the participating organizations of the Inter-Organization.
- Direct contribution to the work of the SAICM secretariat through the provision of a WHO staff member preparing for the second session of the International Conference on Chemicals Management with responsibility for coordination of the work on emerging policy issues, reporting on implementation of SAICM and a high-level round table on public health, the environment and chemicals safety. In the second half of 2009, activities focused on initial work to develop a strategy for strengthening the engagement of the health sector in the implementation of SAICM. This directly responds to resolution II/8 of the second session of the Conference and has included preparations for a consultation of invited experts to develop the draft strategy. Work supported by WHO has been completed on the development of the SAICM Information Clearinghouse with the pilot-testing of the Clearing-house among selected SAICM stakeholders.

International Health Regulations (2005) (IHR). The revised IHR have a broader remit than previously and now cover all events of potential international public health concern, including disease outbreaks of known, or suspected, chemical etiology. Countries are required to build core capacities for the detection and surveillance of such outbreaks, and can call upon the support of the WHO and the international community to manage the outbreaks. In 2009, chemical safety contributed to the development of two WHO draft documents to ensure coverage of chemical incidents: the *IHR Checklist and indicators for monitoring core capacities in States Parties*; and the *Protocol for assessing national surveillance and response capacities for the International Health Regulations (IHR)*.

Inter-organization Programme for the Sound Management of Chemicals (IOMC). The IOMC coordinates the chemicals policies and programmes of its Participating Organizations (FAO, ILO, UNEP, UNIDO, UNITAR, WHO and OECD) and two Observer Organizations (UNDP and the World Bank). WHO is the administering agency for the IOMC and provides its Secretariat. In 2009, two regular meetings of the IOMC were held, from 15-16 April, in Geneva and from 14-15 October, in Washington, D.C. See: <http://www.iomc.info>

7. CAPACITY BUILDING

Capacity building activities are reported under the subject-specific previous chapters. This section lists presentations and training courses.

Presentations and Training Courses:

Cardiff, United Kingdom

Two training sessions on the INTOX Data Management System were organized in Cardiff, UK, 28-30 September 2009. The first was a two-day course for 14 new or prospective users of the system, from: S Africa, Azerbaijan, Lithuania, Romania, Former Yugoslavian Republic of Macedonia, Russia, Jamaica, Trinidad, Uruguay and India. This was followed by a one-day course for 15 existing users of the system, from: Ghana, Morocco, Chile, Uruguay, Brazil, Jamaica, Trinidad, Ecuador, Malaysia, China, Philippines and India.

Stockholm, Sweden

A keynote lecture entitled "*Strategies for establishing and sustaining a poison centre*" was presented at the 29th International Congress of the European Association of Poisons Centres and Clinical Toxicologists, which took place on 12-15 May 2009. The abstract has been published in the journal *Clinical Toxicology*, 47(5): 464.

Sun City, South Africa

A continuing education course on the public health management of chemical incidents and emergencies was organized for the 7th Conference of Toxicology in Developing Countries, 6 September.

A presentation was given at the 7th Conference of Toxicology in Developing Countries entitled "*Roles and challenges for poisons centres in developing countries*".

Hammamet, Tunisia

Emergency responders were trained during sessions of the WHO Public Health Pre-deployment (PHPD) training course on environmental health issues in emergencies, including chemical incidents, 30 November - 11 December, in Tunisia. The PHPD course is organized by the WHO Cluster for Health Action in Crises (HAC) together with WHO Mediterranean Centre for Health Risk Reduction (WMC).

Bangkok, Thailand

A two-day exercise session on the WHO Human Health Risk Assessment Toolkit was held at the annual regional Training Course on Environmental and Health Risk Assessment and Management of Toxic Chemicals, Chulabhorn Research Institute, 10 and 13 December.

Development of training materials

The introductory chapters of the IPCS Poisons Centre Training Manual have been translated into French and Spanish. They are currently being formatted for publication on the IPCS web site.

Dresden, Germany

A Continuing Education Course on Human Exposure Assessment, focussing on WHO/IPCS Harmonization Guidance, was delivered at EUTOTOX2009, in Dresden, Germany, on 13 September. A symposium in the main conference programme was delivered on the WHO Guidance on Characterizing and Applying PBPK Models in Chemical Risk Assessment.

Paris, France

A WHO/OECD Risk Assessment Workshop was delivered to individuals involved in OECD expert groups, from 2-3 November, Paris.

Geneva, Switzerland

In 2009, the training modules focusing on reproductive health were used in the WHO Training Course on Reproductive Health, February 2009.

List of Publications during 2009

Concise International Chemical Assessment Documents

CICAD (No 67) Ethoxyethanol and Propoxyethanol

http://www.who.int/entity/ipcs/publications/cicad/ethoxy_propoxyethanol.pdf

CICAD (No 67) Methoxyethanol

<http://www.who.int/entity/ipcs/publications/cicad/methoxyethanol.pdf>

CICAD (No 72) Iodine and Inorganic Iodides: Human Health Aspects

<http://www.who.int/entity/ipcs/publications/cicad/cicad72.pdf>

CICAD (No 74) 2-Butenal (Crotonaldehyde)

<http://www.who.int/entity/ipcs/publications/cicad/cicad74.pdf>

CICAD (No 75) Cyclic Acid Anhydrides: Human Health Aspects

<http://www.who.int/entity/ipcs/publications/cicad/cicad75.pdf>

CICAD (No 76) Trivalent Chromium Compounds

<http://www.who.int/entity/ipcs/publications/cicad/cicad76.pdf>

Harmonization Project Document Series

Framework for the Risk Assessment of Combined Exposures to Multiple Chemicals

(Draft for public and peer review)

http://www.who.int/entity/ipcs/methods/harmonization/areas/combined_exposure/en/index.html

Final draft WHO Human Health Risk Assessment Toolkit (The draft toolkit is available upon request. The final toolkit will be published in early 2010).

International Chemical Safety Cards (ICSCs)

82 new and updated cards have been published in 2009. These are listed in Appendix 1.

Chemical incidents and emergencies

Manual for the Public Health Management of Chemical Incidents and Emergencies.

http://www.who.int/environmental_health_emergencies/publications/Manual_Chemical_Incidents/en/index.html

Children and Chemicals

3rd International WHO Conference on Environmental Threats to the Health of Children:
Meeting Report - <http://www.who.int/ceh/en/>

Articles published in scientific journals

Eastmond DA, Hartwig A, Anderson D, Anwar WA, Cimino MC, Dobrev I, Douglas GR, Nohmi T, Phillips DH, and Vickers C. Mutagenicity Testing for Chemical Risk Assessment: Update of the WHO/IPCS Harmonized Scheme. *Mutagenesis* (2009) 24(4):341-349

P. Haefliger, M. Mathieu-Nolf, S. Lociciro, C. Ndiaye, M. Coly, A. Diouf, A. Lam Faye, A. Sow, J. Tempowski, J. Pronczuk, A.P. Filipe Junior, R. Bertollini and M. Neira,. Mass Lead Intoxication from Informal Used Lead Acid Battery Recycling in Dakar, Senegal. *Environmental Health Perspectives* (2009) 117: :1535–1540.

Meek ME, Berry, C, Boobis AR., Cohen SM, Hartley M, Munn S, Olin S, Schlatter J and Vickers C (2008)'Re: Guyton, Kathryn Z., Barone, Stanley, Jr., Brown, Rebecca C., Euling, Susan Y., Jinot, Jennifer, Makris, Susan (2008). Mode of Action Frameworks: A Critical Analysis. *Journal of Toxicology and Environmental Health, Part B*, 11(1): 16-31',*Journal of Toxicology and Environmental Health, Part B*,11:8,681 — 685 To link to this Article: DOI: 10.1080/10937400801985648

Golding Jean, Jones Richard, Bruné Marie-Noël, Pronczuk Jenny. Why carry out a longitudinal birth survey? *Paediatric & Perinatal Epidemiology*; Jul 2009 Supplement

Golding Jean, Jones Richard, Preece Alan, Bruné Marie-Noël, Pronczuk Jenny. Choice of environmental components for a longitudinal birth cohort study. *Paediatric & Perinatal Epidemiology*; Jul 2009 Supplement 1, Vol. 23, p134

List of International Chemical Safety Cards published in 2009

ICSC No.	new/upd	Substance	CAS
53	upd	Lindane	58-89-9
54	upd	MCPA	94-74-6
68	upd	Ozone	10028-15-6
72	upd	Selenium	7782-49-2
80	upd	1,1,2-Trichloroethane	79-00-5
87	upd	Acetone	67-64-1
97	upd	Aminocarb	2032-59-9
98	upd	Amitraz	33089-61-1
99	upd	Atrazine	1912-24-9
108	upd	Bromoform	75-25-2
109	upd	Methyl bromide	74-83-9
118	upd	Caprolactam	105-60-2
119	upd	Captafol	2425-06-1
120	upd	Captan	133-06-2
124	upd	Chlordimeform	6164-98-3
125	upd	Chlordimeform hydrochloride	19750-95-9
133	upd	Chloroprene	126-99-8
134	upd	Chlorothalonil	1897-45-6
192	upd	Propylene oxide	75-56-9
224	upd	Benzidine	92-87-5
238	upd	Chloromethyl methyl ether	107-30-2
281	upd	Hydrazine	302-01-2
341	upd	ortho-Toluidine	95-53-4
342	upd	para-Toluidine	108-44-1
343	upd	meta-Toluidine	106-49-0
487	upd	Hexachlorocyclohexane (mixed isomers)	608-73-1
529	upd	Oxalic acid	144-62-7
535	upd	1-Pentanol	71-41-0
536	upd	3-Pentanol	584-02-1
707	upd	Oxalic acid dihydrate	6153-56-6
771	upd	Sodium methanolate	124-41-4
795	upd	alpha-hexachlorocyclohexane	319-84-6
796	upd	beta-hexachlorocyclohexane	319-85-7
823	upd	Allylamine	107-11-9
866	upd	Diallylamine	124-02-7
899	upd	2-hydroxy propyl acrylate	999-61-1
913	upd	Lithium hydroxide	1310-65-2
914	upd	Lithium hydroxide monohydrate	1310-66-3
937	upd	Phenothiazine	92-84-2

<u>ICSC No.</u>	<u>new/upd</u>	<u>Substance</u>	<u>CAS</u>
941	upd	Propylamine	107-10-8
960	upd	ortho-Tolidine	119-93-7
970	upd	ortho-Anisidine	90-04-0
971	upd	para-Anisidine	104-94-9
1018	upd	Butyl methacrylate	97-88-1
1123	upd	Triethylenetetramine	112-24-3
1168	upd	2,3-Butanedione	431-03-8
1200	upd	Sodium sulfite	7757-83-7
1215	upd	Gypsum	13397-24-5
1288	upd	N-hexyl acrylate	2499-95-8
1292	upd	Diocetyl adipate	103-23-1
1294	upd	3-Methyl-2-butenal	107-86-8
1383	nw	Pentaerythritol	115-77-5
1428	nw	2-Pentanol	6032-29-7
1477	upd	1-Decene	872-05-9
1589	upd	Calcium sulfate anhydrous	7778-18-9
1664	nw	3-Chloro-1,2-propanediol	96-24-2
1700	nw	Ketoconazole	65277-42-1
1706	nw	Ethyl tertiary butyl ether (etbe)	637-92-3
1713	nw	Bromine chloride	13863-41-7
1715	nw	Iron dichloride	7758-94-3
1716	nw	Linalyl acetate	115-95-7
1727	nw	2,4-Dichlorotoluene	95-73-8
1728	nw	2,6-Dichlorotoluene	118-69-4
1729	nw	1,1-Difluoroethane (HFC-15a)	75-37-6
1730	nw	Triethylphosphate	78-40-0
1731	nw	Potassium methanolate	865-33-8
1734	nw	Calcium sulfate, dihydrate	10101-41-4
1735	nw	Decene	25339-53-1
1736	nw	Calcium gluconate	299-28-5
1737	nw	Sodium gluconate	527-07-1
1738	nw	Gluconic acid	526-95-4
1740	nw	Vanilin	121-33-5
1741	nw	ε-Caprolactone	502-44-3
1742	nw	Hydroxypropyl acrylate	25584-83-2
1743	nw	Isooctyl acrylate	29590-42-9
1745	nw	1,3-Dimethylurea	96-31-1
1746	nw	2-Methylbut-3-yn-ol	115-19-5
1748	nw	3-Methyl butanal	590-86-3
1749	nw	Tetraethylene glycol methyl ether	23783-42-8
1750	nw	Tetraethylene glycol butyl ether	1559-34-8
1751	nw	Tripropylene glycol methyl ether	25498-49-1
1752	nw	Dipropylene glycol methyl ether acetate	88917-22-0

Meetings held in 2009

Training and Continuing Education Courses are listed in Section 7 of the main report.

23-24 March 2009

Planning meeting for International Workshop on identifying important Life Stages for monitoring and assessing risks from exposures to Environmental Contaminants
Washington DC, USA

30 March-3 April 2009

International Chemical Safety Cards Peer-Review Meeting
WHO Headquarters, Geneva, Switzerland

27-29 April 2009

Drafting Group meeting on Guidance for Immunotoxicity Risk Assessment for Chemicals
Bilthoven, Netherlands

2-4 June 2009

WHO/IPCS Consultation on DDT Hazard Assessment
WHO Headquarters, Geneva, Switzerland

7-10 June 2009

3rd International WHO Conference on Children's Health and the Environment
Republic of Korea

24-26 June 2009

WHO and Rotterdam Convention Secretariat Joint Workshop to Improve Capacities for the Identification of Severely Hazardous Pesticide Formulations for Submission under the Rotterdam Convention
Dar es Salaam, United Republic of Tanzania

6-8 July 2009

WHO/IPCS International Workshop on Principles of Characterizing and Applying PBPK Models in Risk Assessment
Berlin, Germany

29-30 July 2009

Risk Assessment Toolkit Briefing Meeting of Pilot Countries Leading into Pilot Phase
Bangkok, Thailand

28 September-1 October 2009

Sixth Meeting of Users of the IPCS INTOX Data Management System
Cardiff, United Kingdom

29-30 October 2009

Review Meeting of the WHO Risk Assessment Toolkit
Lyon, France

23-27 November 2009

International Chemical Safety Cards Peer-Review Meeting
Lyon, France

3-4 December 2009

WHO Meeting on Chemicals of Major Public Health Concern
Geneva, Switzerland

15-16 December 2009

WHO Consultation on DDT Human Exposure Assessment
Bradford, United Kingdom