

Chemical Safety and Children's Health

**Protecting the world's
children from harmful
chemical exposures:
a global guide
to resources**

Prepared by the
Intergovernmental Forum on Chemical Safety (IFCS)
Children and Chemical Safety Working Group



October 2005

The listing of resources in this pamphlet is intended to provide information and guidance. The mention of specific resources or their producers does not imply that they are endorsed or recommended by the Intergovernmental Forum on Chemical Safety in preference to others of a similar nature that are not mentioned.

Links to additional resources can be found on the IFCS website at:

<http://www.who.int/ifcs/documents/forums/forum4/children/en/>

Suggestions of additional resources for listing on the IFCS website may be submitted to the IFCS Secretariat (email: ifcs@who.int).

Intergovernmental Forum on Chemical Safety (IFCS)
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The publication was a collaboration among the work group members and does not necessarily represent the views of the individual organizations with which they are affiliated.

Introduction

Whether you are a government official, a physician, a nurse, a teacher, or a parent, you face a variety of challenges to keeping children and families healthy. One important area that may be overlooked is the possibility of harmful exposures to chemicals in the environment. Yet every day children may be exposed to a variety of potentially hazardous chemicals in the air they breathe, in the food and water they consume, in their homes and schools, at work, and in play areas. Some of these chemicals are naturally occurring but others are a result of human activities. Either way, they may have serious effects on children's health. Children's harmful exposures to chemicals should therefore always be minimized and prevented whenever possible.

Governments from around the world have agreed that addressing chemical threats to children's health should be an integral component of every country's public health and environmental

agenda. Individuals, organizations, and agencies responsible for protecting children need to become more aware of the threats and take actions to prevent them. The achievement of the Millennium Development Goals (MDGs)¹, especially those that aim at reducing child mortality (MDG 4) and ensuring environmental sustainability (MDG 7) requires the safe and sound management of chemicals.

This publication will:

- Alert a variety of potential stakeholders to the problem of hazardous chemicals in the global environment and the reasons that children are particularly vulnerable;
- Describe recent international recommendations intended to guide efforts to protect children from harmful chemical exposures; and
- Suggest strategies and available resources that can help government officials and other stakeholders to prevent harm to children.

¹ Millennium Development Goals (MDGs) <http://www.un.org/millenniumgoals/>

Chemical threats to children's health

Chemicals are beneficial to many aspects of daily life, but some chemicals are also harmful to human health—especially the health and development of children. The World Health Organization estimates that unintentional poisonings annually account for the deaths of more than 35,000 children under age 15¹. Many more children suffer from illness and disability related to chemical poisonings or chronic exposure to chemical pollutants in their environment.

The social and economic cost of children's harmful exposure to chemicals can be high. In addition to direct medical expenses, there are sick days that keep children away from school and their parents away from work, and the emotional toll that childhood illness, disability and death takes on families and communities.

Poor children are the most vulnerable and may suffer the most harm, as they tend to be undernourished, live in more polluted environments, and lack access to health care and education. Moreover, persistent poor health of children can contribute to a cycle of poverty, negatively impacting the long-term productivity of communities and entire nations.

Detailed background information about protecting children from harmful chemical exposures, including common chemicals of concern for children's health can be found at:
http://www.who.int/ifcs/forums/forum4/meet_docs/en/index.html and
http://www.who.int/ifcs/documents/forum/forum/en/11inf_en.pdf

¹ World Health Organization. Global Burden of Disease Project, version 5. GBD 2002 Estimates. http://www3.who.int/whosis/menu.cfm?path=evidenceburden,burden_estimates&language=english.

Why children are more vulnerable

More research is needed to better understand exactly how certain chemicals pose a threat to children's health. Some studies have suggested that the risk of developing cancer, for example, might be higher when exposure to carcinogens begins at conception or in childhood. In addition, there are concerns that some chemicals may affect the developmental processes *in utero* and early in life, for instance, by interfering with genetic expression, disturbing the endocrine system, altering cell development in major organs or through other, less well understood, mechanisms. While scientists do not yet have all the answers, it is now clear that children are uniquely prone to harmful chemical exposures and uniquely vulnerable to their adverse health effects for a variety of reasons, including:

- Children's **exposures begin at conception**, as chemicals in a pregnant woman's body cross the placenta and affect the embryo or fetus during critical periods of development. Some chemicals also accumulate in breast milk, compromising (though not negating) the benefits of this important food for infants¹.
- Even after birth, children's **bodies remain immature**, with under-developed detoxification mechanisms to protect them from chemicals.
- Their **brains and other organ systems are constantly developing**, undergoing periods of particular sensitivity to damage or disruption.
- Compared with adults, children **breathe faster and eat and drink more** in proportion to their bodyweight, resulting in greater exposure to chemicals in air, food, and water.
- Children **spend more time outdoors**, and often play on the ground or the floor, where chemicals such as pesticides and heavy metals are present. In addition, young children frequently **place their hands or other objects in their mouths**, making ingestion of chemicals more likely.
- Pregnant women and young children are often at higher risk of **inhaling or coming into contact with chemicals used indoors**, such as cleaning solutions, paints, cosmetics, and other household and consumer products.
- Children are **less aware of potential chemical risks around them**, and are therefore less likely to avoid harmful exposures.

¹ In spite of this, WHO promotes exclusive breast feeding for the first 6 months of life given the considerable benefits for mothers and children everywhere. Ref. Breast Milk: An Optimal Food, Environmental Health Perspectives, vol 112, number 13, September 2004; <http://ehp.niehs.nih.gov/docs/2004/112-13/editorial.html>

Recommendations of the Intergovernmental Forum on Chemical Safety

Chemical risks to children's health can be reduced through:

- Actions to reduce children's exposures to hazardous chemicals;
- Greater awareness — on the part of government officials, health care providers, parents, and others — of children's special vulnerabilities;
- Better availability of information and guidelines for preventive actions at all levels; and
- The resolve to create and implement preventive laws and policies governing chemicals in children's environment.

The remainder of this brochure describes specific recommendations from the fourth

session of the Intergovernmental Forum on Chemical Safety (Forum IV). Issues related to children and chemical safety were an important focus of discussion at Forum IV. The Forum considered specific ways to protect children from harmful exposures and adopted recommendations calling for action by international organizations, national governments, and public and private sector institutions and individuals. Numerous initiatives at the national and international level have begun this important work and provide models for additional efforts.

The following recommendations are aimed at achieving *measurable progress* toward protecting children from chemicals in the immediate future.



Consider chemical exposures at all stages of development

Recommendation 1:
When assessing the protection of children, consideration should be given to chemical exposures that can occur during preconception, throughout gestation, infancy, childhood and adolescence.

Traditional chemical risk assessments do not always consider the full range of potential exposures that affect children, starting with parental exposures before conception. Likewise, the range of tests typically used to determine chemical toxicity may not be adequate to assess the health consequences of exposures to very small amounts of certain chemicals during various sensitive developmental stages.

This recommendation is directed toward government agencies, academic research institutions, the chemical industry, and others who undertake

research and risk assessments to evaluate the potential harm to children from exposure to chemicals. Recognition of the need to evaluate exposures and outcomes at *all life stages that affect children* — including preconception parental exposure and exposure of pregnant women — is an important and groundbreaking element of this recommendation. It is also important to assess the appropriateness of toxicological tests for understanding the particular effects of chemicals and mixtures of chemicals on embryos, fetuses, infants, young children, and adolescents.

Resources to help you consider chemical exposures at all stages of development

■ **European Environmental Agency - Children's health and environment: A review of evidence. A joint report from the European Environment Agency and the WHO Regional Office for Europe.**

Provides an overview of the available evidence of the relationship between the physical environment and children's health, and identifies both research needs and policy priorities to protect children's health from environmental hazards.

http://reports.eea.eu.int/environmental_issue_report_2002_29/en

EEA homepage: <http://www.eea.eu.int/main.html>

■ **Germany, Federal Environment Agency - Environmental health risks: What are the differences between children and adults?**

Compares possible specific health risks to children with those to adults. Analyzes both non-substance specific and substance specific influences of particular toxicants, such as lead and methylmercury.

http://www.apug.de/archiv/pdf/brochure_children_suscept.pdf

FEA homepage: <http://www.umweltbundesamt.de/index-e.htm>

■ **Intergovernmental Forum on Chemical Safety - Protecting Children from Harmful Chemical Exposures**

Provides background information and the scientific rationale for the IFCS recommendations on Chemical Safety and Children's Health, including information on: why children are particularly vulnerable to chemicals, chemical exposure during developmental stages, and select examples of chemical substances of concern.

http://www.who.int/ifcs/documents/forums/forum4/en/11inf_en.pdf

IFCS homepage: <http://www.ifcs.ch>

■ **United Nations Environment Programme (UNEP), United Nations Children's Fund (UNICEF), and the World Health Organization (WHO) - Children in the New Millennium: Environmental Impact on Health**

Illustrates the link between environment and the well-being of children, with detailed information on children's special vulnerability and susceptibility to environmental threats at each developmental stage, and key environmental hazards.

<http://www.unep.org/ceh>

■ **World Health Organization - Children's Health and the Environment: A Review of Evidence**

Comprehensive review of evidence regarding children's environmental exposures and vulnerabilities, with detailed policy conclusions and recommendations.

http://reports.eea.eu.int/environmental_issue_report_2002_29/en/eip_29.pdf

WHO Regional Office for Europe - Children's Health and Environment homepage: <http://www.who.dk/childhealthenv>

European Environment Agency (EEA) homepage: <http://www.eea.eu.int>



Prepare national assessments and action plans

Recommendation 2: Governments should prepare, through multi-stakeholder consultation, initial national assessments of children's environmental health and chemical safety. These assessments should identify the priority concerns and provide a basis for developing action plans to address those concerns. Governments should provide a progress report to Forum V. WHO is requested to develop, through multi-stakeholder consultation, guidance tools, and to assist at least three countries in different stages of economic development in each region to prepare the assessment and action plans by 2006.

Efforts to protect children, starting at conception, from harmful chemical exposures must be based upon a thorough understanding of the nature and scope of exposures and effects. This recommendation acknowledges that national resources are limited and subject to many demands, and urges each government to prepare a national assessment as a way of facilitating efficient national

prioritization and planning. The national assessment should identify the most serious and urgent problems for action, and should serve as a starting point for ensuring that national chemical control policies will effectively protect children. As the next step, governments are urged to prepare action plans aimed at addressing the problems identified in the national assessments.

National assessments and action plans are most helpful and reliable when they are science-based, with uncertainties and lack of knowledge addressed in a precautionary manner (see Recommendation 5). While individuals with appropriate expertise and knowledge should take the lead in conducting national assessments and action plans, they should do so in an open, inclusive, and collaborative

manner. Health care providers, educators, environmental and community organizations, industry groups, academia, and other sectors have critical insights and an important stake in the outcome of national assessments and action plans. Governments are directed to act in multistakeholder consultation with these and other interested parties through meetings, dialogue, or other means.

Resources to help you prepare national assessments and action plans

■ AAMMA-CICH: Perfil SANA (Perfil de la Salud Ambiental de la Niñez en Argentina)

AAMMA and CICH, the Argentine Ministry of Health and Environment, Health Canada, the University of Ottawa and the Argentine Society of Pediatrics (SAP), are working together to complete a Profile that collects and compiles information on the state of Children's Environmental Health in Argentina.

<http://www.aamma.org/ceh/ceh.htm>

AAMMA homepage: <http://www.aamma.org>

■ Mexico - First National Workshop on Children's Health and the Environment

Overview of this June 2001 workshop to define environmental effects on children's health as a high-priority issue for Mexico and promote the definition, development and implementation of policies, programs, strategies and actions for protecting the health of Mexico's children against environmental risks. Full proceedings are available in Spanish.

Proceedings Introduction Section:

http://www.cec.org/pubs_docs/documents/index.cfm?varlan=espanol&ID=937 (Spanish)

http://www.cec.org/pubs_docs/documents/index.cfm?varlan=english&ID=937 (English)

http://www.cec.org/pubs_docs/documents/index.cfm?varlan=français&ID=937 (French)

NACEC homepage: <http://www.cec.org>

Dirección General de Salud Ambiental homepage: <http://www.salud.gob.mx>

■ Sweden - Environmental Health Report 2005

First national report on the environment and health of children in Sweden.

<http://www.socialstyrelsen.se/NR/ronlyres/4F7D125F-B485-4C03-A69B-43FC5E64D399/3745/20051113.pdf>

National Board of Health and Welfare homepage:

<http://www.sos.se/sosmenye.htm>

■ Toxics Link (India) - The effect of environmental factors on children's health: A fact sheet

Offers information about chemical and other environmental threats to children's health, with emphasis on conditions in India.

<http://www.toxicslink.org/pub-view.php?pubnum=44>

Toxics Link homepage: <http://www.toxicslink.org>

- **World Health Organization - Children's health and environment. Developing action plans.**
 Provides evidence, guidance and tools for countries to implement the Children's Environment and Health Action Plan for Europe.
<http://www.who.dk/childhealthenv/publications/publicationsandreports>
 WHO Regional Office for Europe - Children's Health and Environment homepage:
<http://www.who.dk/childhealthenv>
- **World Health Organization - National Profiles on Children's Health and Environment**
 Provides guidance on preparing a national children's environmental health profile (or rapid assessment).
<http://www.who.int/ceh/profiles/en/>
 WHO homepage: <http://www.who.int>
- **World Health Organization - National Profiles for children's environmental health in Africa**
 Contains information and links to children's health profiles for several countries in Africa.
<http://www.afro.who.int/eph/ceh/country-profile/>
 WHO homepage: <http://www.who.int>
- **World Health Organization - National Profiles for children's environmental health in South America, Latin America, and the Caribbean**
 Contains information and links to children's health profiles for several countries in Latin America and the Caribbean region.
<http://www.who.int/ceh/profiles/amroprofiles/en>
 WHO homepage: <http://www.who.int>
- **United States Centers for Disease Control and Prevention - National Report on Human Exposure to Environmental Chemicals**
 Provides an ongoing assessment of the U.S. population's exposure to environmental chemicals using biological monitoring, updated and expanded every two years. Includes limited child-specific information.
<http://www.cdc.gov/exposurereport/>
 CDC homepage: <http://www.cdc.gov/page.do>



Take actions to prevent and reduce exposure

Recommendation 3: Governments, with support from stakeholders, particularly WHO and UNICEF, should promote education and training on children's chemical safety, and where risks are identified, governments and stakeholders should commit to taking action to prevent or reduce exposure. Governments should also promote harmonized data collection, research, legislation and regulations, and consider the use of indicators of children's environmental health, and report back to Forum V in 2006. Governments should, when setting acceptable levels or criteria related to chemicals, take into consideration the potential enhanced exposures and/or vulnerabilities of children.

Once governments have assessed and prioritized the risks to children from harmful exposures to chemicals, there is much work to do to prevent or reduce those exposures. Although these efforts should be led by governments, they are not the sole responsibility of governments. This recommendation directs governments, with the help of key United Nations agencies and other stakeholders, to undertake a variety of actions to protect children against chemical risks. Organizations and stake-

holder groups may, through a consultative process, agree to take specific individual or joint actions.

As in the previous recommendations, Recommendation 3 makes it clear that principles of stakeholder participation, collaboration, harmonization, and prevention should guide these efforts. Of course, strategies for preventing or reducing exposure may vary according to the priorities, needs and resources of each country.

Education and training

Four different kinds of training would help identify and reduce risks to children:

1) Training health care providers and local health officials to understand, diagnose, and prevent harm from chemicals;

2) Training teachers, child care professionals, and others with responsibility for the welfare of children to practice and teach strategies to prevent and reduce exposures;

3) Raising awareness of politicians and lawmakers and training government regulators to design and implement effective laws and regulations to protect children; and

4) Educating and training parents and children about common chemical risks and ways to protect themselves and their families.

Formal training of teachers, health officials and providers, child care professionals, and regulators can be accomplished through universities, professional societies, governments, intergovernmental organizations, or other organizations or institutions. Education and training of children and adolescents can be done locally through schools at all levels, but help with instructional materials may be needed. To reach politicians, parents, and children most effectively, it may be necessary to explore different and innovative mechanisms of disseminating information through formal and informal education and the wider use of media.

Resources to help you take actions on education and training

■ Agency for Toxic Studies and Disease Registry: Case studies in environmental medicine

A series of self-instructional publications designed to increase the primary care provider's knowledge of hazardous substances in the environment and to aid in the evaluation of potentially exposed patients.

<http://www.atsdr.cdc.gov/HEC/CSEM/> (English)

http://www.atsdr.cdc.gov/es/HEC/CSEM/es_csem.html (Spanish)

ATSDR homepage: <http://www.atsdr.cdc.gov/>

■ Asociación Argentina de Médicos por el Medio Ambiente, AAMMA: "OMS Módulos de Capacitación en Salud Ambiental Infantil para Profesionales de la Salud"

AAMMA adapted and translated WHO Training Package for health care workers on Children's Environmental Health to the regional situation. More information on the activities and the educational tools available in the South Cone of the Americas is available on this website.

AAMMA homepage: <http://www.aamma.org>

■ Canadian Association of Physicians for the Environment - Children's Environmental Health Project

Introduces clinicians and their patients to children's environmental health issues through five units summarizing the current scientific research regarding environmental influences on: 1) respiratory health, 2) neurobehavioural development, 3) cancer and immune functioning, 4) dermatological health, and 5) reproductive health and congenital anomalies in the young.

<http://www.cape.ca/children/>

CAPE homepage: <http://www.cape.ca>

■ Exposure to Chemicals During Pregnancy

This website for perinatologists, referring physicians, and genetic counselors contains a variety of educational resources and links regarding fetal exposures to chemicals.

<http://www.perinatology.com/exposures/chemlist.htm>

perinatology.com homepage: <http://www.perinatology.com/>

■ National Environmental Education and Training Foundation (United States) - Pediatric Environmental History Initiative

Initiative to incorporate environmental history taking into the pediatric clinical practice of health care providers. <http://www.neetf.org/Health/PEHI.htm>

NEETF homepage: <http://www.neetf.org>

- **National Institute of Environmental Health Science (United States) - Environmental Health Science Education**
 Clearing house for primary and secondary education, teachers resources and student pages.
<http://www.niehs.nih.gov/science-education/home.htm> (English)
<http://www.niehs.nih.gov/science-education/espanol.htm> (Spanish)
 NIEHS homepage: <http://www.niehs.nih.gov/>
- **World Health Organization - Training Modules for Health Care Providers Improving the capacity to diagnose, prevent and manage paediatric diseases linked to the environment**
 A collection of over 40 modules with internationally harmonized information and peer-reviewed materials to enable health care workers to be trained, and also to become trainers of their peers and colleagues. The modules include extensive notes and references, case studies and self-evaluation tools, backed up by manuals and guidelines.
<http://www.who.int/ceh/capacity/trainpackage/en/>
 WHO homepage: <http://www.who.int>
- **World Health Organization - Guidelines on the prevention of toxic exposures: education and public awareness activities**
 Guidelines to help governments, national agencies, and communities to plan, carry out and evaluate education programs promoting safe use of chemicals and prevention of poisoning.
http://www.who.int/ipcs/features/prevention_guidelines.pdf
 WHO homepage: <http://www.who.int>
- **World Health Organization - Hazardous chemicals in human and environmental health: A resource book for school, college and university students**
 Resource book to encourage students to carefully consider potential detrimental effects on health and environment of hazardous chemicals and to take appropriate action.
http://whqlibdoc.who.int/hq/2000/WHO_PCS_00.1.pdf
 WHO homepage: <http://www.who.int>



Legislation and regulations

Governments should promote legislation and regulations aimed at preventing and reducing children's harmful exposures to chemicals. Many countries have already implemented such laws and regulations, and the sharing of best approaches and innovative actions that can be replicated will serve to build on successful national experiences (see Recommendation 5).

Resources to help you take actions on legislation and regulations

■ **Canadian Environmental Law Association - Environmental Standard Setting and Children's Health**

Examines the adequacy of the standard-setting process for protecting the health of children, with a focus on Canada.

<http://62.44.8.131/publications/cardfile.shtml?x=1114>

CELA homepage: <http://www.cela.ca>

■ **Physicians for Social Responsibility and the Center for International Environmental Law - Using International Law and Institutions to Protect Children's Environmental Health**

Detailed handbook describing key international and regional laws and institutions and their relevance to efforts by civil society, government officials, individuals, and institutions to protect children's environmental health.

http://www.envirohealthaction.org/includes/display/article_print.cfm?article_ID=219 or

http://www.ciel.org/Publications/ChildrensHealth_June2005.pdf

PSR homepage: <http://www.psr.org>

CIEL homepage: <http://www.ciel.org>

■ **United States Environmental Protection Agency - Food Quality Protection Act**

Provides background information and text of landmark U.S. law that established a health-based standard for pesticides in foods and provides special protections for infants and children.

<http://www.epa.gov/opppsps1/fqpa/>

U.S. EPA homepage: <http://www.epa.gov>

Data collection and research

Efforts to protect children from chemical threats will be more effective if based on solid information. Consequently, this recommendation urges countries to promote research on the effects of chemical exposure at all lifestages (preconception through adolescence) on children's health. It also directs governments to promote harmonized data collection processes in order to facilitate efficient use of resources and common understandings among research institutions and their audiences.

Useful research may be simple or sophisticated. Several types of research that might add particular value to efforts to better protect children from harmful chemical exposures include:

- Further research on the links between chemical exposure and health outcomes in different age groups, developmental stages, and settings;
- Development of new risk assessment approaches geared specifically to children, and toxicity testing data that further explore the impact of early life exposure;
- Research to determine how to incorporate new scientific information (i.e. genomics, proteomics) toward understanding the mechanisms of toxic action which are associated with early life exposure and their risks; and
- Innovative research incorporating children and chemicals into development assistance programmes.

Long-term studies on the environmental influences on children's health include the consideration of exposures to chemicals. A series of harmonized, internationally agreed protocols will support the collection of data and observations in a comparable manner.

Resources to help you take action on data collection and research

■ **The National Children's Study (United States)**

Study examining the effects of environmental influences on the health and development of more than 100,000 children across the United States, following them from before birth until age 21.

<http://nationalchildrensstudy.gov/>

■ **Pesticide Action Network North America - Los Invasores**

Químicos Pesticidas en Nuestros Cuerpos y la Responsabilidad Empresarial

Non-governmental report on pesticide biomonitoring results in the United States, with emphasis on findings of pesticide levels in children and other vulnerable populations.

<http://www.panna.org/campaigns/docsTrespass/chemicalTrespass2004.dv.html> (English)

<http://www.panna.org/campaigns/docsTrespass/chemicalTrespass2004.dv.html#esp> (Spanish)

Executive Summary (French) [http://www.panna.org/campaigns/docsTrespass/CTExSumFrench\(print\).pdf](http://www.panna.org/campaigns/docsTrespass/CTExSumFrench(print).pdf)

PANNA homepage: <http://www.panna.org>

PAN-International homepage: <http://www.pan-international.org/>

■ **United States Environmental Protection Agency - Voluntary Children's Chemical Evaluation Program (VCCEP)**

Program to provide data to enable the public to understand the potential health risks to children associated with certain chemical exposures.

<http://www.epa.gov/chemrtk/vccep/index.htm>

U.S. EPA homepage: <http://www.epa.gov>

■ **World Health Organization: Long term studies on children's health and the environment: Identifying, assessing and following up the effects of exposure to environmental factors**

Provides background information on Long Term Cohort Studies (LTCS) of environmental influences on children's health and an overview of WHO activities related to LTCS.

<http://www.who.int/ceh/research/longtermstudies/en/>

WHO homepage: <http://www.who.int>

■ **World Health Organization: "Green Page for Clinical Records"**

Tool for collecting information on the environmental quality and contaminants present in the places where children live for inclusion in the clinical records. (available January 2006) <http://www.who.int/ceh/en/>

WHO homepage: <http://www.who.int>

Indicators of Children's Health

Governments are also urged to consider establishing indicators of children's environmental health. Such indicators can help to bridge the gap between information about environmental quality and information about the health status of a population, putting into focus the special vulnerabilities of children in order to guide policy and actions. However, in many countries, surveillance of basic indicators such as chemical poisoning incidents, hospitalizations, and rates of chronic diseases (like cancer) that may be related to chemical exposures is not uniform or reliable. Countries should therefore begin by defining priorities and collecting data on the basic indicators, progressing over time to more sophisticated indicators. By maximizing the use of existing data and taking a flexible approach to collecting and reporting indicators, countries can work toward a harmonized and complete assessment of the state of children's environmental health over the long term.

Over the long term, both basic and more subtle indicators can assist in:

- Identifying potential sources of childhood chemical exposures of concern;
- Identifying health and developmental outcomes that may be related to children's exposures;
- Tracking trends in exposures and health outcomes; and
- Measuring progress in preventing exposures and reducing illness.

Both the health and environment sectors should be involved establishing and tracking indicators, so that both can monitor their efforts towards realizing healthy environments for healthy children.

Resources to help you take actions on indicators of children's health

■ **EnviroHealthAction - Using Indicators to Measure Progress on Children's Environmental Health**

Jointly sponsored by the International Research and Information Network for Children's Health Environment and Safety, the International Society of Doctors for the Environment, Physicians for Social Responsibility, the United Nations Children's Fund, the United Nations Environment Programme, and the World Health Organization, this document explains the use of children's environmental health indicators in efforts to protect children and calls on governments, non-governmental organizations, the private sector, communities, and UN agencies to work together to develop and use them.

http://envirohealthaction.org/children/articles.cfm?article_ID=123 (English)

http://www.envirohealthaction.org/upload_files/PSR_spanishindicators_final.pdf (Spanish)

EnviroHealthAction homepage: <http://www.envirohealthaction.org>

■ **Global Initiative on Children's Environmental Health Indicators - CEHI**

The objectives of the Global Initiative are to: develop and promote use of children's environmental health indicators, improve assessment of children's environmental health and monitor the success or failure of interventions, facilitate the ability of policy-makers to improve environmental conditions for children.

<http://www.who.int/ceh/indicators/en/>

WHO homepage: <http://www.who.int>

■ **From Theory to Action: Implementing the WSSD Global Initiative on Children's Environmental Health Indicators**

This White Paper provides the basis for putting the Global Initiative on Children's Environmental Health Indicators (CEHI), launched at the World Summit on Sustainable Development, into practice. This roadmap outlines the operational and technical processes for implementing the development, collection and reporting of indicators at the regional and country level.

http://www.who.int/ceh/publications/924159188_9/en/index.html

WHO homepage: <http://www.who.int>

■ **Making a Difference: Indicators to Improve Children's Environmental Health**

Discusses and describes some of the principles that need to be considered in developing effective environmental health indicators for children. It applies these to produce a set of indicators, targeted at the main disease burdens that affect children.

<http://www.who.int/phe/children/en/cehindic.pdf>

WHO homepage: <http://www.who.int>

■ **North American Commission for Environmental Cooperation – Children's Health and the Environment in North America - A First Report on Available Indicators and Measures**

Includes a set of indicators of children's health and the environment to provide decision-makers and the public with a means of measuring and promoting change.

http://www.cec.org/programs_projects/pollutants_health/project/index.cfm?projectID=28&varlan=english (English)

http://www.cec.org/programs_projects/pollutants_health/project/index.cfm?varlan=espanol&projectID=28 (Spanish)

http://www.cec.org/programs_projects/pollutants_health/project/index.cfm?varlan=français&projectID=28 (French)

NACEC homepage: <http://www.cec.org>

■ **World Health Organization - Indicators to Improve Children's Environmental Health**

Includes background on the concept of children's environmental health indicators, information regarding the Global Initiative on Children's Environmental Health Indicators, and links to regional pilot projects.

<http://www.who.int/ceh/indicators/en>

WHO homepage: <http://www.who.int>





Coordinate research

Recommendation 4
WHO is requested to support, collaborate with, and coordinate among research organizations and those supporting research (such as the European Commission, science non-governmental organizations, the Global Health Research Forum, governments and others) to develop mechanisms to facilitate collaborative national and international research and share technology.

Although actions to reduce and prevent harmful exposures to chemicals need not wait for definitive information, there is nevertheless a need to better understand the science and become aware of new knowledge about children's health and chemicals. Recommendation 4 underscores this continuing necessity, and recognizes the expertise of the World Health Organization as a coordinator and facilitator of scientific research and technology sharing.

There is often benefit in seemingly overlapping or duplicative research. However, research can be better targeted to needs, and resources identified and used most efficiently, through coordination and cooperation. Mechanisms to achieve coordin-

ated research efforts might include:

- An information sharing platform to make each of these research organizations aware of each other's ongoing and planned research; and
- A vehicle for sharing data and technology.

WHO is specifically asked to develop such mechanisms to facilitate collaborative and coordinated research, but other entities engaged in research have a role to play in actively collaborating and sharing research findings. The recommendation lists some of the many public and private institutions and organizations and governments that support or conduct research relating to the effects of chemicals on children.

Resources to help you coordinate research

- **American Chemistry Council Long Range Research Initiative**
Industry initiative sponsoring research to expand scientific knowledge of the potential impacts of chemicals on the health of human and wildlife populations and the environment.
<http://www.usfri.org/>
ACC homepage: <http://www.americanchemistry.com/>
- **United States Environmental Protection Agency (EPA) HPV Challenge Program**
The goal of the HPV Challenge Program is to ensure that a baseline set of health and environmental effects data on approximately 2,800 high production volume (HPV) chemicals is made available to EPA and the public.
<http://www.epa.gov/chemrtk/volchall.htm>
U.S. EPA homepage: <http://www.epa.gov>
- **United States Environmental Protection Agency (EPA) Voluntary Children's Chemical Evaluation Program (VCCEP)**
Program to provide data to enable the public to understand the potential health risks to children associated with certain chemical exposures.
<http://www.epa.gov/chemrtk/vccep/>
U.S. EPA homepage: <http://www.epa.gov>
- **Organization for Economic Cooperation and Development - Children's Environmental Health Research Project**
A project on the economic valuation of environmental health risks to children to help policymakers identify health and safety risks, and to develop guidelines for the valuation of children's health and environmental risks.
http://www.oecd.org/document/16/0,2340,en_2649_32495306_35143376_1_1_1_1,00.html



Share information on options for action

Recommendation 5
Governments and stakeholders should commit to sharing information on options for taking effective action to protect children from established chemical threats and from chemical risks where there is a degree of uncertainty. WHO is requested to convene a multi-stakeholder meeting to explore the mechanisms for collecting data and disseminating information that could be used to reduce uncertainty in risk assessments.

This recommendation acknowledges that degrees of uncertainty about chemical hazards and exposures can make it difficult to determine the best course of action to protect children. There can be many sources of uncertainty. Usually there is simply insufficient toxicological or epidemiological data to draw conclusions about causality and appropriately assess risks. Even where we can

undertake a risk assessment, there are still uncertainties about:

- Exactly how children are exposed to some chemicals;
- How to appropriately extrapolate animal toxicity data to humans;
- What the appropriate variability and range of susceptibility might be across human populations, including the fetus, infant, child, and adolescent; and

- Possible synergistic or antagonistic effects of mixtures of chemicals within the body.

A practical course is to reduce or eliminate uncertainties whenever possible. One means of reducing uncertainties is the establishment of a mechanism to collect and share data and information broadly so that all who are responsible for assessing risks and using risk assessments have the best, most recent information. Where elimination of uncertainty is not possible, it is important to clearly articulate the nature of the uncertainties in an objective and

transparent manner. Risk assessments, legislation, and regulations intended to protect children can often account for uncertainties by including uncertainty factors and other assumptions that err in favor of safety.

Many governments, organizations and institutions around the world have considerable experience taking effective action to protect children from harmful exposures to chemicals in those circumstances. This recommendation encourages such actors to share their ideas and experiences on possible options for action.

Resources to help you share information on options for action

■ **APHA - Children's Environmental Health: Reducing Risk in a Dangerous World:**

ISBN 0-87553-241-This publication may be ordered from the following website: <http://www.apha.org/ppp/hipmain.htm>

■ **APHA - Child Health and the Environment:**

ISBN 0-19-513559-8. This publication may be ordered from the following website: <http://www.apha.org/ppp/hipmain.htm>

■ **Protecting children from established and uncertain chemical threats: Tools and mechanisms for information towards prevention - WHO Workshop (17 to 19 October, 2005)**

Case studies and guidance materials for communicating information and undertaking prevention.

<http://www.who.int/ceh/en/>

WHO homepage: <http://www.who.int>

■ **European Environment Agency - Late lessons from early warnings: the precautionary principle 1896-2000**

Case studies related to the costs and benefits of the actions and inactions of governments and others in responding to early warnings about environmental hazards include:

Chapter6: PCB and the precautionary principle

Chapter 8: The DES story: long term consequences of prenatal exposure

Chapter 12: The precautionary principle and early warnings of chemical contamination of the Great Lakes

Chapter 14: Hormones as growth promoter: the precautionary principle or a political risk assessment

http://reports.eea.eu.int/environmental_issue_report_2001_22/en

European Environment Agency (EEA) homepage: <http://www.eea.eu.int>

■ **World Health Organization - Children's Health and Environment Case Studies Summary Book**

Collection of European case studies to enable countries to share their experiences in the planning and implementation of actions to improve children's health and environment.

<http://www.euro.who.int/childhealthenv>

WHO Regional Office for Europe - Children's Health and Environment homepage: <http://www.who.dk/childhealthenv>





Refer to detailed IFCS documents for implementation

Recommendation 6
In carrying out the recommendations set out in this priority, the stakeholders concerned should be guided by the full decision document and companion information paper that were developed by the Forum Standing Committee working group on children and chemical safety.

These recommendations were based upon a decision document summarizing the issues and needs for action and an even more detailed back-ground document. Both of these documents may provide useful information that could help in implementation of these

actions. The *Protecting Children from Harmful Chemical Exposures Decision Document* can be found at: http://www.who.int/ifcs/Forums/ForumIV/Meet_docs.htm and the detailed information document can be found at: http://www.who.int/ifcs/documents/Forum/ForumIV/Meeting_docs/11NF_En.pdf.

A final word

The adverse consequences of harmful exposures to chemicals, including the effects on children's health and development, are becoming increasingly better understood. However, chemicals are necessary to make many products and services that improve and protect people's health, safety and quality of life. Governments and responsible stakeholders must therefore be mindful of both the benefits and the risks of chemicals when making risk management decisions. The ultimate goal should be to provide the benefits in the safest way possible, being particularly cautious in protecting children of all ages and stages from harmful exposures.

Everyone has responsibility for protecting children, and the participants at Forum IV agreed that the recommendations of the Forum should be conveyed to other relevant fora and audiences around the world. Fulfilling the commitments of these recommended actions from IFCS should be an integrated and cooperative effort that involves governments, the public health and education communities, academia, industry, parents, citizen advocates, and others, working toward a common goal: the protection of all children from chemical threats.

Additional general resources

General references to assessment and management of chemical risks to children

■ American Academy of Pediatrics

Pediatric Environmental Health (“Green Book”)

Handbook providing physicians with tools for identifying, treating, and preventing pediatric environmental health hazards. Available for purchase online.

http://www.aap.org/bst/showdetl.cfm?&DID=15&Product_ID=1697

Committee on Environmental Health reports.

AAP homepage: <http://www.aap.org/>

■ Asociación Argentina de Médicos por el Medio Ambiente, AAMMA

Provides information and links in Spanish about children’s health and the environment with special emphasis in the exposure to chemicals. Information on activities and actions related to the chemical international polices and treaties, practical tools and latest news on research.

AAMMA homepage: <http://www.aamma.org>

■ Canadian Partnership for Children’s Health and Environment

An affiliation of Canadian organizations working together to protect children’s health from environmental contaminants.

<http://www.healthyenvironmentforkids.ca/english/> (English)

<http://www.healthyenvironmentforkids.ca/francais/> (French)

■ Children’s Environmental Health Coalition

A national non-profit organization dedicated to educating the public, specifically parents and caregivers, about environmental toxins that affect children’s health. http://www.chechnet.org/improve_main.asp

■ Children’s Environmental Health Network

A national multi-disciplinary organization whose mission is to protect the fetus and the child from environmental health hazards and promote a healthy environment. <http://www.cehn.org/>

■ Environmental Health Perspectives – Children’s Health Section

Contains links to children’s health articles from this peer-reviewed journal of the United States’ National Institute of Environmental Health Sciences.

<http://ehp.niehs.nih.gov/children/>

EHP homepage: <http://ehp.niehs.nih.gov/>

- **Greater Boston Physicians for Social Responsibility (GBPSR):**
 In Harm's Way: Toxic Threats to Child Development Project - Addressing Toxic Chemical Influences on Developmental Disabilities(peer-reviewed report); and a training program and associated educational materials to educate health care providers on the linkages between environmental contaminants and neurodevelopmental disabilities.
<http://psr.igc.org/ihw-project.htm>
- **Healthy Environments for Children Alliance (HECA)**
 Worldwide alliance to reduce environmental risks to children's health.
 HECA homepage: <http://www.who.int/heca/en/>
 Resources for Teaching Healthy Environments for Children
<http://www.who.int/heca/advocacy/press/resources/en/>
- **International Network on Children's Health, Environment and Safety (INCHES)**
 Global network of people and organizations interested in promoting the protection of children from environmental and safety hazards.
<http://www.inchesnetwork.net>
- **International POPs Elimination Network - Community Monitoring Working Group Body Burden Handbook**
 The Body Burden Community Monitoring Handbook provides a source of information on the body burdens of chemicals and community monitoring initiatives. It serves as a central point for the collection and dissemination of community generated or sourced monitoring data and information.
 Children's Health & Chemicals section-
<http://www.oztoxics.org/cmwg/>
 Body Burden Handbook Homepage- <http://www.oztoxics.org/>
- **IPCS Training module No. 1: Chemical safety - Fundamentals of applied toxicology: The nature of chemical hazards (2nd rev. ed.) [pdf 2.7MB]**
 Section 1.1 - Physical form of chemicals; Section 1.2 - Health effects of chemicals
 (WHO/PCS/97.14)
http://whqlibdoc.who.int/hq/1997/WHO_PCS_97.14_pp1-81.pdf
 WHO homepage: <http://www.who.int>

- **IPCS Training module No. 4: General scientific principles of chemical safety [pdf 7.2MB]**
(WHO/PCS/00.8)
http://whqlibdoc.who.int/hq/2000/WHO_PCS_00.8_pp1-104.pdf
WHO homepage: <http://www.who.int>
- **IPCS Training module No. 4 (document 2): General scientific principles of chemical safety**
http://whqlibdoc.who.int/hq/2000/WHO_PCS_00.8_pp105-205.pdf
WHO homepage: <http://www.who.int>
- **Food and Agriculture Organization, United Nations Environment Programme, and the World Health Organization - Childhood Pesticide Poisoning Information for Advocacy and Action**
Document provides information for advocacy and action directed at reducing pesticide poisoning and addressing its effects on children and women
<http://www.who.int/ceh/publications/en/pestpoisoning.pdf>
- **U.S. Environmental Protection Agency - Healthy School Environment Resource**
Healthy School Environment Resources is your gateway to on-line resources to help facility managers, school administrators, architects, design engineers, school nurses, parents, teachers and staff address environmental health issues in schools.
<http://cfpub.epa.gov/schools/index.cfm>
- **U.S. Environmental Protection Agency - Office of Children's Health Protection**
U.S. EPA's gateway to information about environmental risks to children. Includes information on scientific data and methods, standards and regulations, and health risks to children.
<http://yosemite.epa.gov/ochp/ochpweb.nsf/homepage>

■ **U.S. Environmental Protection Agency - Toxicity and Exposure Assessment for Children's Health (TEACH)**

Information on scientific literature in the field of children's environmental health for 18 chemicals or chemical groups of concern to children. The goal of the TEACH project is to complement existing children's health information resources by providing a listing and summary of scientific literature applicable to children's health risks due to chemical exposure.

<http://cfpub2.epa.gov/teach>

■ **U.S. Environmental Protection Agency:**

What you can do to protect children from environmental risks

<http://yosemite.epa.gov/ochp/ochpweb.nsf/content/tips.htm>

Cómo Proteger a los Niños de los Riesgos Ambientales :

http://yosemite.epa.gov/ochp/ochpweb.nsf/content/tips_sp.htm

Tips in Vietnamese [http://yosemite.epa.gov/ochp/ochpweb.nsf/content/VNtips3.htm/\\$File/VNtips3.pdf](http://yosemite.epa.gov/ochp/ochpweb.nsf/content/VNtips3.htm/$File/VNtips3.pdf)

■ **Voices for Children - "Better Safe than Sorry" - Acting Now to Protect Children's Environmental Health**

<http://voicesforchildren.ca/report-Feb2005-1.htm>

Voices for children homepage: <http://voicesforchildren.ca/>

■ **World Health Organization - Children's Health and the Environment: A Global Perspective, A resource Manual for the Health Sector**

ISBN 92 4 156292 7

It is a reference manual for health care providers and policy makers that includes case studies of environmental illnesses, tips on taking pediatric environmental histories, and ways people can take action to improve children's health. This publication may be ordered from the following website:

<http://www.who.int/bookorders/anglais/detart1.jsp?sesslan=1&codlan=1&codcol=15&codcch=622>

An "e-library" CD-ROM containing more than 100 documents concerning children's environmental health. (available 2007)

WHO homepage: <http://www.who.int>