REGIONAL WORKSHOP

Environmental Threats to the Health of Children IN THE AMERICAS

Lima, Peru, 9–11 April 2003

Workshop Report

Sustainable Development and Environmental Health
Pan American Health Organization
World Health Organization
REGIONAL WORKSHOP

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to the Health of Children
IN THE AMERICAS

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Workshop Report
Acknowledgements

The Pan American Health Organization, Regional Office for the Americas of the World Health Organization, wishes to thank the following institutions and individuals for their collaboration in the development of this workshop:

Sponsors
United States Centers for Disease Control and Prevention
United States National Institute of Environmental Health Sciences

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- Ministry of Health of Peru
- North American Commission for Environmental Cooperation
- United States Environmental Protection Agency

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Pan American Health Organization
World Health Organization
Lima, 2003
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1. Background
In Latin American and the Caribbean there are many environmental hazards that pose serious risks to our children's well being. Lack of access to safe water and inadequate waste disposal continue to be major causes of disease in children from the Region. In addition, exposure to metals, pesticides and other persistent organic pollutants, and indoor and outdoor air pollutants are cause for concern since these represents a serious hazard to children's health and a large number of children suffer from these exposures.

Children are more vulnerable than adults to environmental hazards. Children breathe more air, eat more food, and drink more water than adults in relation to their weight. A child's body is not ready to metabolize and eliminate many toxins from the body and its immaturity heightens the vulnerability of the body organs and systems to environmental insults. In addition, children are not aware of environmental hazards; thus they can not protect themselves from these exposures.

Many of these environmental hazards to children's health arise or are exacerbated from the rapid changes in the economic situations of the countries that have occurred in the last decades leading to the rapid growth of urban areas, environmental degradation and the import and misuse of hazardous chemical substances, among others. In addition, a limited awareness on the adverse impact of toxic exposures, have impaired its recognition and the development and implementation of prevention and control measures to protect children's health.

The Pan American Health Organization (PAHO) has designed the strategy “Healthy Environments: Healthy Children” with the purpose of advancing regional movements to improve the health and well being of children in the Americas, and the future productivity of its society, by promoting the creation of healthy environments. A first step of this initiative was the conduct of the workshop “Environmental Threats to the Health of Children in the Americas”, which was held in Lima, Peru, on April 9-11, 2003. The workshop was sponsored by the United States Centers for Disease Control and Prevention (CDC) and the United States National Institute for Environmental Health Sciences (NIEHS) and it brought together public health professionals, scientists and policy experts from the Region to discuss progress being made in the Americas on protecting children from environmental hazards. A total of 64 participants representing 26 countries of the Americas attended the workshop. The workshop also commemorated World Health Day 2003, with its coinciding theme: “Shape the Future of Life: Healthy Environments for Children".
2. Objectives
The objectives of the workshop were:

- To identify urgent actions to make immediate, positive impacts in children’s environmental health and empower communities to act at the local level.
- To prepare a regional overview of the situation of children’s environmental health based on a collection of basic information at the country level.
- To form groups of experts to increase collaboration on research that supports the field of children’s environmental health in the Americas.
- To specify PAHO and country participation in the international core children’s environmental health indicators initiative.
- To promote commitment on the part of participants to encourage countries to develop national action plans on children’s environmental health.

The workshop was the Region’s initial response to the World Summit on Sustainable Development call for a global Healthy Environments for Children Alliance.
3. Summaries of Sessions
3.1 Opening and Welcome

**SPEAKERS**

*Dr. Fernando Carbone*, Minister of Health, Peru
*Dr. Marie-Andrée Diouf Romisch*, PAHO/WHO Representative, Peru
*Dr. Mauricio Pardón*, CEPIS/PAHO
*Dr. Jenny Pronczuk*, WHO

Dr. Mauricio Pardón opened the workshop by welcoming participants to the PAHO’s Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS/PAHO). He highlighted CEPIS/PAHO experience in the Region on matters related to water, sanitation and hygiene and acknowledged the diverse specialties and expertise, as well as the geographic diversity represented in the room. Dr. Diouf highlighted two key points: 1) that the World Health Organization (WHO) Healthy Environments for Children Alliance is a call for inter-sectoral collaboration so that children’s lives are healthier where they live, learn and play and, 2) that a child must have a world without violence and war in order to grow healthy and meet its potential. Dr. Jenny Pronczuk, representing Dr. David Nabarro, Executive Director, Program of Health and Environment of WHO, thanked everyone for celebrating World Health Day and acknowledged the CDC and the NIEHS for sponsoring the workshop. She informed the group that Dr. Nabarro awaits information, tools, inspiration, and far reaching collaboration from the Region on the topic of children environmental health.

The keynote address from Dr. Fernando Carbone pointed out that environment affects all lifestyles: “In Lima, we might ask children to watch for cars and in the Amazon they say to watch out for the crocodiles in the river.” These are different words but offer the same message: a healthy environment is important for children. Dr. Carbone reminded the participants that they were meeting in order to discuss how other children across Latin America and the Caribbean would have the opportunity to grow in healthy environments and highlighted that numbers of child deaths are not statistics but rather faces. Dr. Carbone applauded the participants for their work supporting all of humanity and reminded the group that the goal set forth at the workshop is one of a healthy world for our children and our grandchildren, concluding that the dream of healthy environments for children must become a reality.

3.2 Vulnerability of Children to Environmental Assaults

**SPEAKER**

*Dr. Philip Landrigan*, Mount Sinai School of Medicine

Dr. Landrigan presented the overarching theme of the workshop, that of the special vulnerability of children to environmental threats. Children have greater exposure to environmental threats; they drink more water, breathe more air, and eat more food per body weight than adults. Children live nearer to the floor and exhibit hand to mouth behavior. They have a decreased ability to detoxify, and heightened biological vulnerability. This is of particular importance in today’s society as there has been a huge explosion of chemical production since World War II, and little information is available on the toxicity of these chemicals. In industrialized nations, infectious diseases have become less powerful, and new, chronic pediatric illnesses related to other causes arise. They include asthma, cancer, birth defects, and developmental disabilities. About 25 to 30% of these illnesses are thought to be caused or worsened by environment, in particular through exposures to toxins such as lead, asbestos, and pesticides. Dr. Landrigan highlighted several things that need to occur to protect our children: more comprehensive toxicological testing of chemicals both old and new; more research in the labo-
3.3 Key Environmental Issues Facing Children in the Region

There are key environmental issues that threaten the health of our children which workshop participants presented in detail, informing the group on the issues, its most recent findings, and urgent needs that could help to combat the problems. Poverty and malnutrition were posed as the center of child health problems, often making the many other environmental threats even more dangerous to child health and well-being.

3.4 Water and Sanitation

**SPEAKER**

*Horst Otterstetter, Inter-American Association for Sanitary and Environmental Engineering*

Sufficient supplies of quality water, access to sanitation and good hygiene practices are keys to preventing diarrheal disease. The World Summit on Sustainable Development and Millennium Development Goals contain important statements on improving water quality and sanitation and lowering the incidence of childhood diarrhea. To address this issue, a region-wide process is needed and there must be an understanding that water and children’s environmental health are intricately related to sustainable human development.

He presented data showing that in Latin America and the Caribbean 107 million people do not have sanitation, and 76 million do not have water services. Of that, 33.7 million children under 15 do not have access to sanitation and 24 million children under 15 do not have water services. He maintained that there needed to be better data on morbidity of children related to water and sanitation, that the true need was to achieve 100% disinfection of drinking water in the Region and that national drinking water quality standards needed to be developed for the countries of the Region. He also suggested that national recreational water quality standards be developed and he stated that economic impacts of diarrhea had to be demonstrated in order to gain a sufficient level of priority for government investment and action.

3.5 Air Pollution

**SPEAKER**

*Dr. Marcelo Kac, CEPIS/PAHO*

Acute Respiratory Infections (ARI) are a major cause of mortality in children under five in the Region. Outdoor air pollution in certain cities of Latin America and the Caribbean greatly exceeds WHO clean air guidelines. The quality of indoor air is also of concern, with biomass fuel and tobacco smoke being the major sources of indoor pollutants.

The typical situation in Latin America and the Caribbean regarding air pollution is depicted by urbanization, an increase in poverty and inequity, disorganized and informal economic development, obsolete technology, and often inadequate government policies. Ambient monitoring programs are weak and indoor air standards are practically non-existent. While some countries have air quality regulations, they are often incapable of implementing them. General awareness on the part of individuals and governments is limited. There are few university curricula in the Region that address air pollution, health effects of air pollution, or the importance of air quality. Instead, the public health agendas of countries tend to focus on water as a priority.
Countries need to develop national plans, policies, standards and local action plans. There needs to be a better understanding of air-related problems, as well as ongoing monitoring and formation of action strategies. Research needs include determining acute and chronic exposures and estimating health impacts, evaluating the effects of both traditional and modern risks, estimating health impact from smoke, fine particulate matter, mixes of contaminants and non-traditional contaminants, especially diesel, and developing models that give economic valuation of the health impact of air pollution.

3.6 Pollutants, Poisonings, and Injuries

**SPEAKER**

*Dr. Jenny Pronczuk, WHO*

Children do not understand risks and are much more vulnerable to accidental environmental exposures and injuries. Accidents comprise 20% of the global burden of disease and include drowning, traffic accidents, poisoning, burns and falls, among others. One million children under 15 years old died from accidents in the year 2000. For example, in the year 2000, poisonings caused 50,000 deaths in children under age 14. In addition, developmental problems may be related to chemical exposures and there is debate as to whether diseases without good explanation (e.g. increase in the incidence of childhood diabetes) could be related to certain chemicals in the water. Settings that give rise to hazards from poisonings and injuries include the home, school, play areas, and worksites in both rural and urban zones. These settings tend to offer more vulnerabilities in developing countries where there is less ability to manage chemicals, less legislation, a lack of information, other priorities, and other high human health risks like malnutrition.

There is a high cost to society associated with poisonings that goes beyond the traditionally contemplated costs of hospitalization. An analysis of the cost of lead exposure shows a cost of billions of dollars to society. In addition, time of parents away from work to care for a sick child is often not counted. Dr. Pronczuk stated that countries, regions or organizations need to establish the number, cause and characteristics of poisonings and accidents to impress on policy makers the importance of prevention. The implementation of indicators programs to describe status of these outcomes and show changes over time are suggested for this purpose. She also indicated a need to look into chronic exposures to pollutants such as lead, mercury, pesticides, POPs, mycotoxins, nitrates, nitrites, fluoride, arsenic and manganese.

3.7 Vector-Borne Infections

**SPEAKER**

*Dr. Hector Gómez Dantés, Mexico Ministry of Health*

Malaria, dengue, Chagas disease, yellow fever and leishmaniasis are some of the vector borne infections prevalent in the Americas. In fact, their occurrence has increased in the last decade. Dr. Gomez noted that current data are not reflective of reality due to vast under-reporting of cases. Some reasons for these increases are urbanization, deforestation and agricultural/irrigation practices. Key to controlling vector-borne infections is eliminating breeding grounds of vectors through means such as introducing natural predators, applying pesticides, and using biological agents. Key to reducing effects of disease is working through the health sector on prevention, such as vaccination campaigns, and offering good diagnostics. Many individual-level interventions such as use of repellants, mosquito nets, and household applications of pesticides are also important to avoiding infections.
3.8 Persistent Organic Pollutants and Endocrine Disrupting Chemicals

**Speaker**

Dr. Terri Damstra, WHO

Wherever measured, in the environment or humans, researchers find evidence of persistent organic pollutants (POPs), which are accumulative through the food chain. The top of the food chain is the most exposed and indigenous populations are particularly at risk because of their typical diet. There is concern that low level chronic exposures may have caused wildlife abnormalities in the reproductive cycle and sex organs. At the same time, an increase in human hormone related cancers, e.g. breast and testicular cancer has been observed. Exposure at the fetal and neonatal stages during development of hormonal programming could have effects later in life, such as immune deficiencies, hypospadias, low birth weight, precocious puberty, and diabetes. The International Treaty on POPs, also called the Stockholm Convention, was signed in 2001. This convention addressed the so-called “dirty dozen” POPs, including aldrin, dieldrin, chlordane, DDT, endrin, heptachlor, mirex, toxaphene, polychlorinated biphenyls, hexachlorobenzene, dibenzodioxins, and dibenzofuranes.

Currently there is no scientific consensus on POPs and their effects on humans. A global assessment of the state of the science on endocrine disruptors was done in 2002. It concluded that there was sufficient evidence that chemicals have hormone-like activity and that wildlife effects were observed due to endocrine mediation; however, there was not strong evidence of human effects. Dr. Damstra closed her presentation by stating that prevention is still the most effective way to reduce health effects from environmental hazards in children.

3.9 National Profiles on Children Environmental Health

As stated in the objectives for the workshop, one outcome sought by PAHO was to develop a regional perspective on children’s environmental health to know the key issues, understand the government-readiness for taking on an initiative at national levels, get a sense of the potential sectors involved, and scope out the level of awareness on this issue. With this in mind, PAHO worked closely with six countries to develop national profiles of children’s environmental health. In addition, 12 countries also prepare profiles independently. Two sessions were held to present findings from these efforts.

Development of the profiles involved input from several ministries, sectors, the public and coordination with PAHO. Countries presented facts about their key mortality and morbidity concerns, environmental conditions, legislative support, access to information, and availability of research. The presenters made statements as to the readiness of their governments to act in protection of children from environmental threats and made overall summarizations about the situation of children’s environmental health in their countries. Annex 4 contains the guidelines for the development of the children’s environmental health profiles that were prepared by PAHO and distributed to participants for this purpose. Copies of the national profiles are available on the CEPIS website.

3.10 The Health Sector is at the Front Line

**Speakers**

Dr. Irena Buka, Commission for Environmental Cooperation of North America
Dr. Juan Carlos Bossio, PAHO
Dr. Daniel Beltramino, Pediatric Association, Argentina
A panel on the health sector role in children’s environmental health presented health professionals as the front line to prevent harmful environmental exposures. Dr. Buka called for increased awareness of health professionals about children’s environmental health and noted several gaps of knowledge in the health sector, such as the need for environmental health cause and effect models, the need to increase access to reliable data, the need for more research on children’s environmental health and the need for a roadmap to prevent environment-related health impacts and injuries.

Dr. Bossio presented the Integrated Management of Childhood Illnesses (IMCI) program as an example of success in improving holistic healthcare to children in the Region. IMCI helps to educate families and communities, improving both primary care as well as parental awareness. Dr. Bossio shared his interest in addressing environmental risk factors to child health through the IMCI program. He noted that IMCI can offer an existing network of health professionals to promote children’s environmental health, as well as provide access to communities. Given the success of IMCI over the past few years of its implementation, Dr. Bossio believed that it can offer valuable experience leading to increased healthcare professional awareness in the area of children’s environmental health.

Dr. Beltramino spoke about the importance of environmental history taking, a practice of asking questions about environmental exposures when patients visit clinicians offices for either sick or well-child visits. He suggested that using a standard format for environmental history taking offered a standardized way to collect clinical information, serving to educate both the clinician and the child or family member. There are problems with implementing pediatric environmental health history taking, such as lack of awareness on the part of the healthcare professional about the importance of this task, the lack of training and understanding of what questions to ask, limited time for patient consultations, overburdened clinics that lack personnel, and a general lack of motivation on the part of the healthcare professionals.

Finally, it was stated that physicians must make children’s environmental health a priority in their practice. They have a responsibility for treatment and are in a position to identify risks and educate parents or guardian about them to prevent further exposures.

3.11 Information and Indicators Boost the Policy Agenda

Speakers
Ms. Eva Rehfuess, WHO
Mr. Ed Chu, U. S. Environmental Protection Agency
Dr. Mildred Maisonet, CEPIS/PAHO

Indicators were presented as a useful tool to promote children’s environmental health. Ms. Rehfuess presented an update on the global children’s environmental health indicators initiative that resulted from the World Summit on Sustainable Development. She introduced the traditional models for developing environmental and environmental health indicators. Ms. Rehfuess then presented a modification, the MEME (Multiple Exposures-Multiple Effects) model, which is thought to be most suitable for conceptualizing, developing, and reporting children’s environmental health indicators. Various projects are using this model and some lessons were learned from these. Ms. Rehfuess believed that a global initiative on children’s environmental health offered many benefits, such as showing worldwide status of children’s environmental health, allowing for some comparisons across countries and offering tools to assess the effectiveness of policies and interventions. She stated that the
global initiative aims to work on a region-by-region basis, with each region setting their own priorities. She welcomed the participation of Latin America and the Caribbean on this initiative.

Mr. Chu shared an example of implementing the Multiple Exposures-Multiple Effects Model, through his experience with the Commission on Environmental Cooperation of North America children’s environmental health indicators effort. Mr. Chu explained how the model was used as a basis for the three North American countries to agree upon indicators they would collect and report. Mr. Chu offered insights as to how the North American countries proceeded in developing a joint children’s environmental health indicators project, the status of this project and the plans for the next year, which included the publication of a first report of children’s environmental health indicators by the Commission.

Dr. Maisonet responded briefly to the two presentations on indicators, offering some areas of interest on the part of PAHO. She opened the floor for questions and discussion, with the goal of determining interest level in a Latin American and Caribbean children’s environmental health indicators initiative. Some discussion ensued, showing interest in such an initiative, and a break-out group was set up for the end of the workshop to deepen and further this discussion.

3.12 From Research and Science to Prevention and Reduction of Exposure

SPEAKERS
Dr. Ellen Silbergeld, Johns Hopkins University
Dr. Fernando Diaz-Barriga, San Luis Potosi’s Autonomous University

Dr. Silbergeld noted that there are basically three types of environmental health research: basic, epidemiology, and toxicology. She highlighted the many gaps in knowledge regarding children’s environmental health, including early exposures, late outcomes, variability in dose, effects of mixtures, role of diet in toxic responses and variability in response. She then posed the questions: How can basic research change ideas about children’s environmental health? Why should it be supported? She suggested that good research must show links between environmental exposures and health outcomes, such as mercury use in gold mining and the increased likelihood of malaria infections. Dr. Silbergeld fascinated the participants with her discussion of gene-environment interactions, offering this as a new way of thinking of how disease is acquired, noting there were many ways that the environment modifies genes or genes modify the environment. In summary, Dr. Silbergeld maintained that basic research may help identify new concepts for the role of environment in children’s health and that research can provide tools for clinical epidemiological studies.

Professor Diaz-Barriga noted that we have a great beginning in that we know there is a problem related to environmental exposures in children and we know why. He noted the country profiles underway and highlighted the science already presented at the workshop, noting that all that was required at this point was funding and knowledge. Professor Diaz-Barriga maintained that risk evaluation has a role in decision-making on children’s environmental health; there is proof that environmental contaminants are affecting the health of children. He also believes that something can be done and that simple information collection and proof could help get attention to key concerns. He maintained that funding would become available if the work could begin and that a primary mistake in Latin America and the Caribbean was to seek funding before project planning and implementation. Professor Diaz-Barriga highlighted key areas for action, including research, toxicological surveillance, teaching pediatricians, improving laboratory services, and designing education programs. Dr. Diaz-
Barriga suggested that finding creative ways to tap into existing research, exchange science resources among countries, and develop projects that are appealing to donors are ways to gain support for research on children’s environmental health in the Region.

3.13 The Contribution of Pollutants to the Cost of Disease in Children

**SPEAKERS**

*Dr. Jenny Pronczuk*, WHO  
*Dr. Philip Landrigan*, Mount Sinai School of Medicine  
*Mrs. Margarita Petrera*, PAHO/Peru

A special forum was conducted as part of the meeting to address the economic implications of environmental pollution on children’s health. Participation in the workshop was by invitation-only and the forum was developed to bring the opportunity to a large group of Peruvian public health professionals to attend one of the workshop sessions. The intention was to allow them to gain awareness on children environmental health and its economic burden, as well as to exchange of views and information with workshop participants. The first speaker was Dr. Pronczuk, who gave us insight on the many societal and environmental changes causing environmental degradation and the risks it poses to the health of children. She also explained why children are more vulnerable to environmental insults and proposed several prevention strategies to reduce exposures including education, advocacy and diagnosis and research of environmentally-related diseases.

Dr. Landrigan stated that children around the world are surrounded by an ever increasing number of chemicals. These exposures are increasingly recognized as contributing to the development of many health conditions that are chronic in nature, disabling and sometimes life threatening, such as asthma, cancer, births defects, and developmental disabilities. The burden that these diseases impose on society and the health care system supports the study of the costs of environmental disease in children. Dr. Landrigan mentioned the following as some of the benefits of studying costs: to help focus prevention, to balance arguments about the high costs of pollution prevention, to permit comparisons with other disease costs and societal expenditures and to set priorities and allocate resources. Dr. Landrigan showed the environmentally attributable costs of several diseases for the US and closed by highlighting the elements that are needed to better address the economic costs of environmental pollution on children’s health.

The forum was closed by Ms. Petrera who gave us some reflections on the topic. She reminded us of the importance of a good quality of life for the economic development of a society mentioning productivity and well being as some of the aspects that are affected when the quality of life is diminished. She gave an example about how costs are not always visible and evident and showed that families sustain the larger share of the costs related to disease using the case of Malaria as an example. She proposed that the state should have a leading role in the evaluation of the costs of disease and stated that globalization is not necessarily supporting the economies of developing countries.
4. Recommendations
Four working groups were convened for the participants to discuss and issue recommendations on the following subjects: national plans, urgent actions, indicators, and research.

4.1 Recommendations of the Group on National Plans

4.1.1 To raise awareness on children’s environmental health.

- To position the importance of healthy environment for children among countries’ decision makers as a way to ensure that children’s environmental health gets incorporated in their agendas.
- To impress that children’s environmental health is much more than the improvement of basic sanitation to protect infant’s health.
- To use mass media to strengthen the public’s knowledge on children’s environmental health.
- To communicate, educate, and create awareness on children’s environmental health using the countries’ own priorities as the basis for the development of these actions.

4.1.2 To develop a network on children’s environmental health for the exchange of information among public health professionals.

4.1.3 To promote the construction of children’s environmental health profiles to analyze countries status and capabilities to address related issues.

4.1.4 To expand current work on environmental health to include specific actions to reduce risks for children.

- To expand PAHO’s “Primary Environmental Attention” strategy to work directly with children from the context of the community, the family, and the school.
- To prioritize children’s environmental health promotion and provide for health workers to go beyond basic sanitation.
- To integrate children’s environmental health promotion on all projects developed in the countries.

4.1.5 To develop environmental health policies in the countries of the Region that focus on the protection of children and adolescents.

4.1.6 To integrate national and international actions on children’s environmental health within countries to avoid duplication of efforts or resources.

4.2 Recommendations of the Group on Urgent Actions

4.2.1 Development of a Regional Action Plan on children’s environmental health in 2003

- To ask PAHO to develop a Regional Action Plan on children’s environmental health in 2003 and to request countries of the Region the development and implementation of short term national action plans (2003-2005) to reduce the morbidity and mortality related to environmental hazards.

4.2.2 Information

- To analyze existent infant mortality and morbidity data on health outcomes associated to environmental hazards to identify priority areas.
- To incorporate into current epidemiologic surveillance systems a component on children’s environmental health either by implementing a surveillance of sentinel events or prioritizing on children blood lead levels.
// To ask PAHO to support the countries on standardizing available data or conducting further analysis of existent studies.
// To develop information networks to facilitate the exchange of experiences on children's environmental health.

### 4.2.3 Promotion and Protection
// To inform, educate and communicate to the general population on children's environmental health.
// To promote citizen's participation on the development of healthy environments for children through PAHO's “Primary Environmental Attention” strategy activities.
// To eliminate leaded gasoline use in the Region.
// To prohibit the use of manganese as a gasoline additive.
// To list the most dangerous or illegal pesticides used in countries of the Region and take actions for their elimination.

### 4.2.4 Identification of Capacities for the Development of Alliances and Policies
// To understand the conformation of the countries' environmental health structure and standardize the roles and competencies of the institutions.
// To obtain help from PAHO to establish competencies in children's environmental health and to identify focal points in each country to facilitate the interaction.
// To introduce children's environmental health across countries' policies.
// To develop intra and inter-sectoral alliances through the establishment of committees composed by individuals with high degrees of responsibilities and decision-making capacity within the sectors involved.
// To ask PAHO to send the workshop report to the different ministries to raise awareness and show the importance of children's environmental health and to promote integrated management.
// To include children's environmental health actions in maternal and child health care programs.
// To coordinate actions in children's environmental health with the community.

### 4.2.5 Education
// To train health professionals on matters related to children's environmental health.
// To integrate the environmental health history in pediatric health services of both rural and urban areas.
// To include children's environmental health in educational curricula.

### 4.3 Recommendations of the Group on Indicators

#### 4.3.1 To prioritize in the Region the gathering and reporting on children's environmental health indicators data.

#### 4.3.2 To conduct a feasibility study
// To identify interested countries.
// To obtain country-specific information to assess the availability and feasibility of collecting indicators data.
4.3.3 Contents of the feasibility study
// To determine available data.
// To assess data quality issues.
// To identify where the data are and who has them.
// To identify data gaps and to how to best fill these gaps.
// To describe data differences both within and between countries.
// To use PAHO’s children’s environmental health priority areas as a starting point to define priority areas for the development and implementation of the indicators initiative.

4.3.4 Proposed PAHO roles on the implementation of the children’s environmental health indicators initiative.
// To be a technical advisor for the countries.
// To facilitate and coordinate the indicators initiative.
// To share funding.
// To support capacity building activities on aspects related to the gathering and reporting of indicators.

4.3.5 Proposed countries roles on the implementation of the children’s environmental health indicators initiative.
// To create an inter-sectoral mechanism within the country to help make information available.
// To identify a focal point for children’s environmental health indicators.
// To share funding.
// To analyze indicators data to identify areas for research and action.

4.4 Recommendations of the Group on Research
4.4.1 To measure the children’s body burden and signs of early effects from exposure to certain environmental contaminants through the development of a program on biologic markers.

4.4.2 Proposed priority areas for the development of a program on biologic markers for children.
// exposure to polycyclic aromatic hydrocarbons
    // biomarker of exposure - urinary metabolites
    // biomarkers of effect - hemoglobin and DNA adducts
// exposure to pesticides
    // biomarker of exposure – protein adducts and phosphorilation markers
    // biomarker of effect – early genetic damage (cancer)
    // development of biomarkers for neurotoxic effects
4.4.3 **Elements of a program on biologic markers for children**

- To develop an inventory of potential sources of samples.
- To develop an inventory of laboratories within the Region with analytical capabilities to conduct the proposed analysis.
- To standardize and validate the analytic methods to be employed.
- To develop analytical and scientific capabilities within the Region.
- To develop research studies.

4.4.4 To put together a task force to assess the feasibility of conducting longitudinal studies on children's environmental health within the Region.
Annexes
Annex 1
“Healthy Environments: Healthy Children”
PAHO’s Initiative to Promote Healthy Environments for Children

**Vision, Goals, and Objectives**

**VISION**
Children in the Latin American and Caribbean Region live, grow, learn, play, and work in an environment that is supportive of good health.

**GOALS**
We make all people aware of the special vulnerability of children to environmental threats and of the need to protect children from environmental hazards.

We promote scientific research and are a source of expertise, scientific information, and indicators on the prevalence of environmental exposures and their impact on children’s health.

We advocate for children’s environmental health and enhance the capabilities of health and environmental authorities to develop and implement prevention and control measures that better protect children from environmental threats.

We contribute worldwide to improve the status of children’s environmental health.

**OBJECTIVES**
Communicate, educate, and raise awareness.

Generate information and report indicators to assess status of children's environmental health.

Promote public policies to protect children’s environmental health.

Implement regional and global actions to better protect children from environmental threats.
Annex 2
List of Participants

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Annex 3

AGENDA

Workshop on Environmental Threats to the Health of Children in the Americas
Lima, Peru, April 9–11, 2003

April 9

8:00  Transportation to CEPIS/PAHO
9:00  Opening and Welcome
   PAHO – MAURICIO PARDÓN, Director, CEPIS/PAHO
   PAHO – MARIE-ANDRÉE DIOUF ROMISCH, PAHO/WHO Peru Representative
   WHO – JENNY PRONCZUK, International Programme on Chemical Safety
   FERNANDO CARBONE, Minister of Health
9:30  Vulnerability of Children to Environmental Assaults
   PHILIP LANDRIGAN, Mount Sinai School of Medicine
10:00 Coffee Break
10:15 Key Environmental Issues Facing Children in the Region
   Moderator: DANIEL BELTRAMINO
   Water and Sanitation
   HORST OTTERSTETTER, International Association for Sanitary Engineering
   Air Pollution
   MARCELO KORC, CEPIS/PAHO
   Pollutants, Poisonings and Injuries
   JENNY PRONCZUK, WHO
11:15 Discussion/Questions and Answers
11:45 Key Environmental Issues Facing Children in the Region
   Moderator: DANIEL BELTRAMINO
   Vector-Borne Infections
   HÉCTOR GÓMEZ DANTÉS, Ministry of Health of Mexico
   POPs and Endocrine-Disrupting Chemicals
   TERRI DAMSTRA, WHO
   Waste Management/Child Scavengers
   ALFREDO GASTAL, Fórum Nacional de Lixo e Cidadania
12:45 Discussion/Questions and Answers
13:00 Lunch Break
14:00 Open Discussion: Practical Tools
   Moderator: LOURDES MINDREAU
   Speakers: MARTA BRYCE, CEPIS/PAHO
   HERNÁN DELGADO, INCAP/PAHO
15:00 Initiating a Network
*Moderator:* MARTA BRYCE
*Speakers:* MARTHA BERGER, U. S. Environmental Protection Agency
IRENA BUKA, Commission for Environmental Cooperation of North America
DIEGO GONZÁLEZ, CEPIS/PAHO

16:00 *Panel: Creating Healthy Environments for Children: First Impressions on What is Happening in the Region*
*Moderator:* MARTHA SHIMKIN
*Speakers:* SILVIA RIVERO, Ministry of Health of Argentina
MELISSA UNDERWOOD, Ministry of Health of Bahamas
DON HOUSTON, Health Canada
GLORIELA BREÑO MURILLO, Ministry of Health of Costa Rica
ISABEL CARBONEL GARCÍA, Ministry of Health of Cuba
DENNIS OMAR BOQUÍN, Ministry of Health of Honduras
PETER KNIGHT, Ministry of Health of Jamaica
RODOLFO ROMERO, Ministry of Health of Paraguay
JOHANNA LAKHISARAN, PAHO/Suriname
CECILIA DORTA, Ministry of Health of Venezuela

17:00 Reception at CEPIS/PAHO
18:00 Transportation to Hotel

**April 10**

8:00 Transportation to CEPIS/PAHO
8:45 Opening Remarks, Announcements
9:00 *Panel: A Closer Look: The Development of Country Profiles on Environmental Threats to the Health of Children*
*Rapporteur:* MARTHA SHIMKIN
*Speakers:* GUILHERME FRANCO NETTO, Ministry of Health of Brazil
SYDNEY LOCKHART, Ministry of Health of Dominican Republic
CLAUDIA VELÁSQUEZ MELGAR, Ministry of Health of Guatemala
LEONORA ROJAS BRACHO, National Institute of Ecology (Mexico)
LUIS CHÁVEZ PAÍS, Ministry of Health of Peru
CRISTINA ALONSO, Ministry of Health of Uruguay

10:30 Coffee Break
10:45 *Panel: The Health Sector is at the Front Line*
*Rapporteur:* LILIAN CORRA
Speakers: IRENA BUKA, Commission for Environmental Cooperation
JUAN CARLOS BOSSIO, PAHO/CEPIS
DANIEL BELTRAMINO, Pediatric Association of Argentina

11:40 Panel: Information and Indicators Boost the Policy Agenda
Rapporteur: TERRI DAMSTRA
Speakers: EVA REHFUESS, WHO
ED CHU, U. S. Environmental Protection Agency
MILDRED MAISONET, CEPIS/PAHO

12:35 Panel: From Research and Science to Prevention and Reduction of Exposure
Rapporteur: MARTHA BERGER
Speakers: ELLEN SILBERGELD, Johns Hopkins University
FERNANDO DÍAZ-BARRIGA, Universidad Autónoma de San Luis Potosí

13:30 Lunch Break

14:30 Break-Out Groups Discuss: How to Improve Children’s Environmental Health?

April 11

9:00 Special Forum at the Swissôtel
The Contribution of Pollutants to the Cost of Disease in Children
Speaker: PHILIP LANDRIGAN, Mount Sinai School of Medicine

11:00 Transportation to CEPIS/PAHO
11:30 Opportunity for Break-Out Groups to Reconvene
12:30 Lunch Break
13:30 Break-Out Groups Sessions
14:00 Group Reports, Conclusions and Recommendations
15:30 Closing Remarks
15:35 Transportation to Hotel
Annex 4
Guidelines for the Development of Country Profiles

1. Introduction

a. Overview of Children’s Environmental Health in the Country

Provide a general synopsis of the country’s position on children’s environmental health, for example, the awareness level of government officials and the acceptance of this as a distinct issue.

b. Key Environmental Issues

PAHO lists key issue areas as drinking water and sanitation, air quality, agricultural chemicals, toxic substances and climate (or vector borne diseases). WHO adds to these waste management, food safety and accidents/injuries. Prioritize these for your country and add additional areas of focus so that there is one prioritized list of environmental concerns for your country.

c. Key Causes of Infant and Under-five Mortality/Morbidity

This information is readily available from the PAHO representation in your country. List the top five causes of illness and death for children under one, for children five and under and for children as a whole. (The age of children varies somewhat from country to country. For example, some use 18 and under, some 20 and under. Define the age group that you are reporting.)

d. Burden of Disease Related to Environment in Children

PAHO has recently worked on this and the representation should have information on the relation of environmental threats to the burden of disease. WHO reports that environmental threats may cause up to one-third of the global burden of disease. What does your country report? It will be interesting to compare to the WHO global figure.

2. National Government Role

a. National Policies

Are there specific national policies or stated priorities that support children’s environmental health? Are there specific national policies or stated priorities that seem to run counter to the objectives of increasing protections of children from environmental harms? (e.g. national decision to not remove lead from gasoline despite the proven health benefits of doing so).

b. Health Sector

How well does the health sector address environmental health in general and children’s environmental health specifically? Does the government have legislation to protect public health from environmental hazards and is this legislation well-implemented? Is there any action to protect vulnerable sub-populations or children in particular? Is the medical and healthcare professional community briefed or trained on environmental threats to
human health? Are there specific clinics or facilities to promote environmental health or children’s environmental health?

c. Environment Sector

Discuss the country’s environmental legislation and its level of enforcement. Is human health a component of environmental legislation and/or is protecting human health part of the mandate of the environment ministry? Are specific media, such as water, air, soil, food, covered by environmental legislation? If so, list which media are covered and list any gaps. Does the environment ministry coordinate well with other ministries, such as health or education and, if so, which ones?

d. Education

With a focus on elementary (age 5 through age 10 or at a natural cut-off for the school system of your country), what are some of the opportunities for health and environmental education? Is there an environmental or a health curriculum taught in these grade levels? Are there schools in rural as well as city settings? Is attendance in the schools required up to a certain age? Would environmental health education through elementary schools be something acceptable in the school systems?

e. Other Pertinent Ministry/Sector

List other pertinent ministries to children’s health and environment. For example, some countries regulate environment through agricultural ministries. Some countries have ministries of culture, science, education, welfare, family and youth issues. What are the ministries at the national government level which would play a role in implementing a national action plan on children’s environmental health? Please list them and describe the role they would play.

3. Society Role

a. Communities

What are the governmental units set up at the community level, such as county seats, communal or city governments? What role do they play or might they take at a local level to better protect children from environmental threats? Do they have the ability to pass local legislation? Are they charged with enforcing national legislation? Could they be enticed to carry out public information campaigns on children’s environmental health?

b. Non-governmental Organizations

Do NGOs play a strong role in building stakeholder input and public participation? What are the key NGOs (both national and international) that would become involved in a national campaign on children’s environmental health? What roles might they play?
c. **Academia**

What academic institutions exist that could promote children’s environmental health through research, advocacy, publications, medical education (both new students and continuing medical education), development and use of environmental history taking, and development and use of indicators? What role would each play and what is your assessment of their level of interest in this topic?

d. **Private Sector**

Are there private companies that would likely be interested in promoting the safety and health of children in the country? For example, pharmaceutical, hygiene and cosmetic products companies, agricultural chemical companies, water companies, food and beverage producers? What role could you foresee the private sector taking, such as financing, public advertisements, educational campaigns, advocating national legislation?

4. **Science**

a. **State of the Science in the Country Related to CEH**

Has anyone in the country conducted research and published results on topics related to environmental health or children's environmental health? Does the country have a science ministry or arm of government and do they publish findings? Is environment or health legislation based on scientific findings?

b. **Capabilities to Conduct Research**

What institutions that promote science and research exist in the country? What type of scientific publications are released in the country? Does the national government invest in research and development? Is financing available to support research at universities, hospitals, laboratories or other facilities? Which institutions would most likely be interested in research on children’s environmental health?

c. **Research Needs**

List the top priority research needs around the topic of children’s environmental health in the country. Is research on these topics underway? Are there barriers to conduct this research and, if so, what would help overcome the barriers? What are the top three ways in which an international organization or other countries could support research in this country?

5. **Data and Reporting**

a. **Information Systems and Centers**

Does the country have a centralized information gathering function on health data? (e. g. health surveillance system)? Does the country have national or private information centers; for example, on health, demographics or environment? Does the country require reporting of certain pediatric diseases to support public health surveillance and disease prevention and, if so, how is that information gathered? Are there poison control centers in the country and, if so, do they record information from calls in a harmonized manner? Does the country report indi-
cators on environment or health? Does the country put out regular reports on disease, public health or environmental conditions?

b. **Data Quality**

The PAHO representations are most likely involved in data gathering on health, and local UNICEF offices probably work on information collection systems, as well. Do the staff in these offices judge data quality as good enough to be useful? Are there other entities that collect data on health, environment or status of children in the country? What are the barriers to data quality in the country?

### 6. Communication

**a. Avenues of Communication**

What are the most effective means for disseminating information in the country, for example television, radio, newspaper? Are these the same for both rural and urban settings? If not, list by rural and urban. What are the most effective means for communications through schools, adult literacy programs, county or local governments? What are other innovative means of communication; for example, through local libraries, street theatres or other local events.

**b. Success Stories in Communication**

Do you know of any local success stories in widespread communication on important topics? For example, to institute the use of postal codes (zip codes) in the United States, a massive education campaign was successfully launched, targeted at specific age groups in schools. Could this success repeat itself, this time carrying a message of children's environmental health?

### 7. Conclusion

**a. Summary of Children's Environmental Health in the Country**

Given your findings, in a page or less, summarize your assessment of your country's ability and interest to take action to improve the environmental health of its children. Is action in this area something you would recommend? What do you view as the areas for natural success? What are the key barriers or areas that need to be addressed to achieve success? Who are the key players?