

Report on European Children's and Birth Cohort Studies, Part B WHO's Programs for Children's Environmental Health

1. Survey Summary

Survey Panel

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Survey Date

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Purpose of Survey

To interview a medical officer in charge of children's environmental health from the World Health Organization (WHO), in order to understand WHO's initiatives in this area.

Person Interviewed

Dr. Jenny Pronczuk, Medical Officer in Children's Health and the Environment, Public Health and Environment (PHE) Department, WHO

Survey Contents and Results

The survey panel received an overview of WHO's programs for children's environmental health and was provided with relevant documents. The WHO initiatives described to the survey panel were as follows:

- Preparation of national profiles on the status of children's environmental health
<https://www.who.int/ceh/profiles/en/>
- Preparation and distribution of training package for health sector
<http://www.who.int/ceh/capacity/trainpackage/en/index.html>
- Preparation and distribution of Green Page for recording environmental history
<http://www.who.int/ceh/capacity/paedenvhistory/en/index.html>
- Adoption of children's environmental health elements into Integrated Management of Childhood Illness (IMCI) initiatives
- Preparation and provision of guidelines for establishing children's environmental health (CEH) centers

<http://www.who.int/ceh/capacity/paedehcentres/en/index.html>

- Provision of technical assistance for WHO member countries
- Implementation of joint research

The following documents were provided to the survey panel:

- Environmental Health Criteria 237, “Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals” IPCS, 2006.
<http://www.who.int/ipcs/publications/ehc/ehc237.pdf>
- “Preventing Disease through Healthy Environments—Towards an estimate of the environmental burden of disease” WHO, 2006.
http://www.who.int/quantifying_ehimpacts/publications/preventingdisease/en/
- Children’s Health and the Environment—A Global Perspective, WHO, 2005.
http://whqlibdoc.who.int/publications/2005/9241562927_eng.pdf

2. Survey Results

2.1 WHO’s View of Children’s Environmental Health

Children are exposed to various kinds of risks depending on the circumstances in their respective countries. These risks include conventional risks such as the impact of industrialization, exposure to unsafe water and food, issues with indoor air quality, and biological-borne infectious disease. They also include known risks such as the use of potentially unsafe chemical substances, effects of traffic and industrialization, and environmental degradation. In addition, there are indeterminate future risks that are just beginning to be understood, such as from persistent organic pollutants (POPs), nanoparticles, climate change, and depletion of the ozone layer.

It is estimated that worldwide, more than three million children under 5 years of age die every year from diseases linked to the environments where they live. This figure includes an estimated 1.6 million deaths from diarrhea, one million deaths from respiratory disease, one million deaths from malaria and other biological-borne infectious diseases, and 300,000 deaths from poisoning and accidents.

The WHO publication *Preventing Disease through Healthy Environments—Towards an estimate of the environmental burden of disease* (2006) reaches the conclusion that the environment has a significant impact on health. The findings of this report including the following data:

- Of 102 major diseases, environmental risk factors contributed to disease burden in 85 categories.
- Globally, an estimated 24% of the disease burden (healthy life years lost) and an estimated 23% all deaths (premature mortality) were attributable to environmental factors. Among children 0–14 years of age, the proportion of deaths attributed to the environment was as high as 36%.

The WHO publication also finds that there are significant disparities in the impact of environmental risk factors on the health of children between developing countries and developed countries. The findings include the following data:

- On average, children in developing countries lose eight times more healthy life years from environmentally caused diseases, per capita, than their counterparts in developed countries.
- In certain very poor regions of the world, the number of healthy life years lost as a result of childhood lower respiratory tract infections is 800 times greater than in developed countries.
- Mental retardation due to lead exposures in general was estimated to be nearly 30 times higher in regions where leaded gasoline was still being used, as compared with regions where leaded gasoline had been completely phased out.

2.2 WHO Initiatives to Address Children's Environmental Health Issues

Following are summaries of WHO projects that were described in detail for the study panel.

A. Preparation and Provision of Guidelines for Establishing Children's Environmental Health Centers

Children's environmental health (CEH) centers are facilities that are able to recognize, assess, and manage environmentally related diseases in children, and provide education and training for medical professionals. They perform the role of hospital, research facility, and educational facility.

Through the cooperation of WHO, these centers have been established in the United States (Pediatric Environmental Health Specialty Units—PEHSU), Canada, Argentina, Mexico, Uruguay, and Spain.

WHO is currently preparing guidance materials on how to set up and run such centers and to take advantage of networking. The final draft will be published in late 2007.

B. Green Page

The Green Page is a children's environmental record that is designed to be inserted into clinical records in order to record environmental risk factors that may have an impact on a child's health. The purpose of the Green Page is to have physicians record a description of the child's environmental circumstances so that information about past exposures can be obtained if the child develops a future condition that may be linked to environmental factors. Data from Green Pages can be tabulated to provide results that are equivalent to implementing a questionnaire-based study. Green Pages are being used in Armenia and other countries.

Fig. 1 English Green Page Draft

CHILDREN'S ENVIRONMENTAL INFORMATION- "GREEN PAGE" (Draft Mar 04)			
Patient's name:		Address:	Date: <input type="text"/>
Sex:	Date of birth:		Case record (number): <input type="text"/>
With whom does the child live?		Living environment:	Professional recording data (name & position):
Is he/she working?		- Rural - Urban - Peri-Urban	Other data:
BUILDING:			
- Home			
- School or child-care			
- Recreation place			
- Community			
GEOGRAPHICAL AREA			
FOOD			
AIR QUALITY			
WATER QUALITY			
SOIL TYPE AND QUALITY			
EXCRETA DISPOSAL			
SOLID WASTE DISPOSAL			
NOISE			
CHEMICALS			
TRAFFIC			
Does the mother/care giver express concerns about the environment? Which ones? Why?			
Are there any well-known environmental risk factors in the area? Which ones?			
Mother's and father's occupation			
Is there exposure to venomous/poisonous animals?			
Are there pet animals at home and in the surrounding? Which ones?			
Are there vectors of disease? Which ones?			
Is there exposure to extreme temperatures? Describe			
Has the child suffered traffic-related injuries? Describe			
Has the child suffered fire-related injuries or others? Describe			
Has the child been exposed to chemical incidents? Describe			
Has the child had poisoning due to chemical; and/or food poisoning? Describe			
Observation (other relevant information)			

C. Children's Environmental Research Led by WHO

Longitudinal Cohort Study

WHO since 2003 has operated an advisory committee for longitudinal cohort studies with funding from the U.S. National Institutes of Health (NIH), the Environmental Protection Agency (EPA), and the Centers for Disease Control (CDC). The advisory committee promotes mutual exchanges between researchers who are involved in longitudinal cohort studies in various countries, with a particular emphasis on assisting longitudinal cohort studies in developing countries. The aims of the advisory committee are to develop core protocols that can be commonly applied for longitudinal cohort studies to study the effects of the environment on the health and development of children, and to collect data in order to increase the value of information assets in each country.

Following are examples of hypotheses from current longitudinal cohort studies:

- There is a link between environmental exposures during early pregnancy and undesirable pregnancy outcomes such as congenital anomalies.
- Physicochemical and environmental causes have an impact on the sexual maturation of children.
- There is a link between childhood exposures to polluted air and increases in the risk of acute lower respiratory tract infection.
- There is a link between exposures to indoor air pollution and middle ear infections.

- There is a link between fetal exposures and increases in the risk of childhood cancer.
- Fetal and childhood exposures to heavy metals and other environmental pollutants with neurotoxic effects have a negative impact on neurodevelopment.

Following are examples of schemes from current longitudinal cohort studies:

- Sample-taking: Blood (maternal blood, paternal blood, children's blood, umbilical cord blood), amniotic fluid, placenta, meconium, urine (maternal urine, children's urine), sperm, hair, nail, mucous swab samples (oral, vaginal, and cervical), saliva, teeth, feces, and other environmental mediums
- Timing of sample-taking: At the time of enrollment, at second and third trimester, at birth, at 3/6/12 months, at each year of age, other

Use of Biomarkers for Assessing Environmental Exposures in Children

WHO, in collaboration with the Pan American Health Organization (PAHO) and WHO/UNEP/ILO International Programme on Chemical Safety (IPCS), convened an International Workshop on Advances in the Use of Biomarkers in Children in Argentina in the year 2005.

The workshop brought together experts from around the world to discuss the possibility of using biomarkers at each stage of children's development in relation to chemical exposures in the environment. The workshop also stressed the need for banking of biological samples to facilitate biomarker research. Study of new biomarkers for environment exposures in children is currently being conducted with funding mainly provided by the National Institute of Environmental Health Sciences (NIEHS).

WHO plans to convene another workshop in FY2008, and is currently seeking a region to host the next workshop.

Other Research Cooperation

Following are examples of research projects that are being conducted through cooperation between WHO and various countries:

- Research into asthma and respiratory disease (Australia and India)
- Research into the impact of arsenic on pregnancy (Thailand and USA)
- Research into persistent organic pollutants (POPs) in breast milk (Mexico and Canada)

2.3 WHO Outlook for Japan and Programs for Children's Environmental Health

WHO is greatly anticipating the prospect that Japan will implement a new longitudinal cohort study with respect to its programs for children's environmental health.

In addition, WHO is looking forward to Japan's contributions in areas such as the WHO-sponsored workshop on children's environmental health that is scheduled to be convened next year.