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*WHO/EEA JOINT
WORKSHOP ON
"CHILDREN'S
ENVIRONMENT AND
HEALTH
INDICATORS"*

European Environment Agency



Report on a WHO-EEA joint meeting

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SCHERFIGSVEJ 8
DK-2100 COPENHAGEN Ø
DENMARK

TEL.: +45 39 17 17 17
TELEFAX: +45 39 17 18 18
TELEX: 12000

E-MAIL: POSTMASTER@WHO.DK
WEB SITE: [HTTP://WWW.EURO.WHO.INT](http://WWW.EURO.WHO.INT)

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ABSTRACT

A joint workshop was held on December 2-3, 2002 at the European Environment Agency to discuss children's environment and health indicators (CEH). The workshop addressed a call made at the Third Ministerial Conference 1999 in London, where children's particular vulnerability to environmental threats was emphasized and the need to develop child-focused environmental policies and develop specific monitoring tools was stressed. This call has been reiterated in a variety of political contexts and linked to several official international declarations, including the recent G8 Ministerial Statement on the World Summit on Sustainable Development (WSSD, 2002)¹, and a type II initiative launched by the United States Environmental Protection Agency (US EPA), in cooperation with several national and international partners including UNICEF, UNEP and WHO.

The workshop brought together experts in the field of environmental health, public health, international agencies, research institutes, country and NGO representatives and addressed the current state of the art for CEH indicators. A proposal on CEH indicators was presented by the WHO European Centre for Environment and Health, Rome and formed the basis for the workshop discussions. Consensus was reached among participants on issues related to suggested approach to indicator development and the proposed framework, to need to include specific adverse social environments as a separate risk factor and indicator grouping, an emphasis on action indicators to inform policy development, the use of a common framework to promote gradual adoption of the same indicators across Member States, the adoption of socio-economic indicators as context indicators, the use of the WHO template for final technical definitions of indicators, and agreement that the set of CEH indicators would form a good basis for the development and monitoring of national children's environment and health action plans.

Keywords

- ❑ ENVIRONMENTAL HEALTH
- ❑ ENVIRONMENTAL EXPOSURE
- ❑ CHILD WELFARE
- ❑ HEALTH STATUS INDICATORS
- ❑ RISK FACTORS
- ❑ SOCIOECONOMIC FACTORS
- ❑ ENVIRONMENTAL MONITORING
- ❑ EUROPE

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¹ Banff Ministerial Statement on the WSSD of the Environmental Leaders of the Eight *'Children's environmental health is of particular concern to G8 Environment Ministers. (...). Recognizing that the task of protecting children's health from environmental threats is ongoing, we agree to collectively advance work on the development of children's environmental health indicators as a means for monitoring progress, in consultation with relevant multilateral organizations'*.

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EEA statement on the need for Children's Environment and Health indicators

This report on the joint EEA/WHO Workshop on Children's Environment and Health (CHE) Indicators in December, 2002 summarises the main states of action on this emerging issue in Europe and the Americas, and points the way towards Europe's first indicator based report on Children and their Environmental Health which Ministers of Health and Environment asked for at the WHO conference in London in 1999.

Now that children have moved centre stage, being the main focus for the next WHO inter-ministerial conference in Budapest 2004, it is timely to review those features of the environments of children, and their relations to health, that we can, or could shortly, monitor with policy relevant indicators. This children's indicator initiative is part of the wider attempt to monitor the development of the health of everyone in Europe, and its links to the environment, via indicators, which is now being piloted in 14 European countries, coordinated by the Bonn office of the WHO.

It is clear that child specific EH indicators are needed to track progress on children's health: but some scientists and policymakers have asked why children need such special attention. After all, children are just one of several sub-groups in the population (such as the elderly, the sick, the immuno-compromised, the genetically vulnerable, pregnant women etc) that are often more sensitive to stressors than the average adult. They, like other sensitive sub-groups, merit particular protection and scientific attention for many reasons, some of which apply to the other sub groups, such as the elderly. However, none of the other sensitive sub-groups have all of the following characteristics of children that together make them particularly "Valuable, Vulnerable and At Risk". (1), and therefore worthy of special attention.

WHY "VULNERABLE"?

Children are generally more biologically sensitive to most stressors during their periods of development and growth, especially in utero and during the earlier years, when precise "windows of susceptibility" provide opportunities for harmful exposures that would otherwise be harmless. The toxicological maxim of Paracelsus-"It's the dose that makes the poison" now needs updating, at least for the developing foetus and young children to "it's the timing of the dose that makes the poison". This special vulnerability is not always so for

all stressors and time windows as children have some biological defences that enable them to detoxify some stressors more efficiently than adults-but these are exceptions to the general rule of their being particularly sensitive to most stressors.

Children generally also receive more exposure per kilogram of body weight than adults, due to their different behaviour patterns, lack of awareness, size and biological metabolisms. Together these factors help to produce a greater "intake fraction" for children, from a given exposure situation, compared to adults. In addition, some adult diseases, even those that emerge much later in life, eg Alzheimers, appear to have some of their origins in utero and childhood. This combination of greater sensitivity to given exposures, and to greater dose from given exposure situations, compared to adults, makes children particularly vulnerable to most stressors during most periods of their childhood. Policies on well studied stressors such as radiation, pharmaceuticals, and some pesticides, already recognize these points by giving special protection to children through lower dose limits compared to adults.

WHY "VALUABLE.?"

The economic dimensions to the environments of children also merit special attention. It is somewhat trite, but sobering to be reminded that children are the only future we have. Parents and societies invest huge amounts of time and other resources in the care and development of children, from conception onwards, and this investment clearly needs protection from the wastage that arises from children's ill health.

Public health investments in children, if protected, have the longest benefit stream compared to investments in adult groups, and, conversely, any health damage to children has the longest cost stream, to both children and society, compared to harm to the elderly and other sensitive sub groups. For example, recent estimates from the US indicate that the annual costs of the environmental components to just 4 fairly well studied diseases in children (asthma, cancer, lead poisoning and neurobehavioural disorders) amounted to \$55billion. (Ref 2 Landrigan et al,2002). The biological sensitivity of children makes "the developing organism of a child likely to be the most sensitive indicator for the environmental health of populations" (3) The role of children therefore, as sources of "early warning's" of health threats to the general population, can be particularly valuable.

WHY "AT RISK"?

Children do not have the capacities to voluntarily avoid many stressor situations, particularly when they are often most at risk ie in utero and during the first years of life. Children are at risk of being ignored, by planners, and architects etc. who, for example, may

design habitats for the car rather than for the child, as well as by policymakers and politicians, who may ignore voteless children. There is an the equity issue also with children in that they face many of the risks and costs of economic and social life but, in general, without getting the same benefits that adults enjoy, such as from cars and other conveniences, like fast foods. Neither can children participate in the determination of the “acceptable” risks arising from otherwise beneficial economic activities, unlike adults who, at least in theory, can participate in such decisions.

Some of these reasons for giving children special protection have long been recognised. The first constraints on capitalism in Europe were focused on children eg the “Health, Welfare and Morals of Apprentices Act”, 1802, and the first effective Factories Act, 1833, which focused the early protection of the factory “hands” in the UK on children and women. There were some tactical reasons for this focus on children, given the initial reluctance to give protection to male adults, but some of these considerations are also valid today, as protecting the “sensitive biomarkers” of children from environmental hazards should, in general, give protection to adults as well.

The science of linking environmental factors to the health of children is, with a few well studied exceptions such as lead in petrol, some air pollutants, and some radiations, in its early stages of development, as was the science of occupational hazards in the early 19th century. The multiplicity and interactions of many causal factors, including genetics, host state, and exposures, makes the attribution of causality in public health much more difficult than it was in the closed systems of exposure that characterized factory environments. However, progress is being made, where proportions of children’s ill health that are caused by specific environmental stressors are now being more reliably estimated (Ref 2), even though the science underlying such estimates remains highly uncertain. This uncertainty in turn calls for more innovative policy actions, based on the precautionary principle, that can prevent environmental ill health, especially to children, before it is too late.

There has been much activity on children’s environmental health since the workshop in both America and Europe, including the publication of the second US report on the state of “America’s Children and the Environment” in early 2003 (4). We in Europe started later than the US on this issue and have some catching up to do, not least in the research and policy development fields.

We hope that this report will help encourage the development of programmes and targets for the Budapest conference that will lead to better protection for Europe's children.

1. EEA/WHO report on children to the London Ministerial Conference in 1999.
2. Landrigan PJ, et al "Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer, and Developmental Disabilities", *Env Health Pers.*, 110, 721-728 (2002)
3. WHO/EEA , "Children's Health and Environment: a Review of Evidence", Foreword, Marc Danzon, WHO European Regional Director, 2002.
4. "America's Children and the Environment: Measures of Contaminants, Body Burdens, and Illnesses", Feb., 2003, from the US EPA, Office of Children's Health Protection, Washington.

David Gee, Coordinator, Emerging Issues and Scientific Liaison, EEA.

SESSION I: Workshop objectives, background and overview of CEH indicator project

A joint workshop was held on December 2-3, 2002 at the European Environment Agency to discuss children's environment and health indicators (CEH). The workshop brought together experts in the field of environmental health, international agencies, research institutes, country and NGO representatives with the following objectives:

1. Discuss the existing indicator proposals (ie. general child health indicators, CEH indicators, and EH indicators);
2. Identify a set of CEH indicators to assess and monitor the state of CHE in the European region and to monitor policies and actions.

It was expected that the workshop would provide the forum to enable participants to:

- Reach consensus about the goals of a European CEH monitoring system;
- Evaluate the existing programs, as well as any ongoing initiatives, in Europe and globally, with respect to the assessment and monitoring of child health and environmental health;
- Provide feedback on existing child health and environmental health monitoring systems or proposals, to improve their focus on environment and on children, respectively;
- Reach consensus about the best framework to be adopted for the identification and definition of CEH indicators;
- Identify the existing gaps and define a timetable and collaborations to fill these gaps, based on the review of the existing proposals.

Expected outcomes of the meeting:

- to get support for the CEH indicator initiative;
- to develop a preliminary draft list of CEH indicators;
- to develop a future plan of action to include pilot implementation of a core and extended set of CEH indicators (i.e. administer pilot feasibility studies; to establish reporting mechanism in pilot countries).

Presentations by meeting organizers

Ondine von Ehrenstein (WHO European Centre for Environment and Health, Rome)

The presentation provided an overview of the background and rationale for developing children's environment and health indicators. At the Third Ministerial Conference

1999 in London, children's particular vulnerability to environmental threats was emphasized and the need to develop child-focused environmental policies and develop specific monitoring tools was stressed. Furthermore, the call for child-specific environmental health indicators has been manifest in a variety of political contexts and linked to several official international declarations, including the recent G8 Ministerial Statement on the World Summit on Sustainable Development (WSSD, 2002)², and a type II initiative launched by the United States Environmental Protection Agency (US EPA) at the same occasion in cooperation with several national and international partners including UNICEF, UNEP and WHO. Additionally, WHO and the EEA have agreed to produce a periodic children's environmental health (CEH) indicator-based report for the European Region.

The rationale for developing child-specific EH indicators is based on:

- biological factors of human development;
- exposure characteristics of children due to their different behaviours and the kinds of settings where children spend most of their time;
- the resulting need for child-focused policies.

Particularly, children, as developing organisms are characterised by:

Windows of susceptibility during development of organs and organ systems;

1. Immature metabolic pathways with differences in detoxification, etc.;
2. Longer time at risk (accumulation of exposure, late effects of early exposures)
3. Higher breathing rates, greater uptake of food and water (5-7 times more), greater skin surface relative to body weight;
4. Unique pathways of exposure due to in-tero and postnatal exposures, time spent on floors, hand to mouth behaviour, dietary habits;
5. Setting-based exposures such as the home, day care centres and schools, playgrounds, means of mobility and transport;
6. Exposure patterns, determined by specific settings, psychosocial, and socioeconomic characteristics (determinants and compensation mechanisms) which differ between children and adults.

² Banff Ministerial Statement on the WSSD of the Environmental Leaders of the Eight 'Children's environmental health is of particular concern to G8 Environment Ministers. (...). Recognizing that the task of protecting children's health from environmental threats is ongoing, we agree to collectively advance work on the development of children's environmental health indicators as a means for monitoring progress, in consultation with relevant multilateral organizations'.

CEH indicators are supposed to enable policy makers to:

1. Assess the state of CEH in their Region, countries, cities;
2. Monitor temporal, geographical and socio-economic trends of important health phenomena in relation to environmental factors;
3. Assess existence and effectiveness of relevant policies and monitor progress in policy implementation;
4. Make international and intra-national comparisons to understand the state of CEH;
5. Advocate for policy development and implementation;
6. Communicate with experts and policy makers from other sectors, with the public, relevant NGOs, and the media.

As the theme of the 4th Ministerial Conference on Environment and Health (Budapest, 2004) will be "The future of our children", an emphasis will be given to the need for developing policies to better protect today's children, as well as future generations, from environmental threats. In addition to the development of indicators, a children's environmental health action plan (CEHAPE) for the European region will be developed and submitted to Member States for adoption at the Budapest conference. It is foreseen that the set of CEH indicators reflect all main areas of the CEHAPE (e.g., a proposed action for the reduction of noise in schools shall relate to an indicator to measure noise in such settings). In this context and long-term, CEH indicators will play a major role in monitoring progress of proposed actions as well as in the monitoring of national CEHAP implementation.

David Gee (EEA co-ordinator , Emerging Issues and Scientific Liaison)

This presentation summarized the reasons why children needed special attention and the purpose of CHE indicators -see above. It also provided some insights into the causes of environmental ill health, including genetics; the immune, nutritional and other features of the "host", ie children; and the indoor and outdoor sources of their multiple and often interacting exposures. The scientific complexity of the issues involved was also stressed including the non-linearity of some causal links, the difficulty in achieving precision about causality, with associated uncertainties, and the multiplicity of legitimate stakeholder perspectives on risks and benefits.(4) The need to find a balance between the comprehensiveness and specificity of indicators was stressed with a preference for getting approximate answers to the whole problem as opposed to a precise answers to small parts of the problem.

This called for more integrated exposure and risk assessments within comprehensive frameworks such as the DPSIR approach used by the EEA. Some of the problems of attributing causality in environmental health were summarized, particularly in the context of scientific methods used in the health and environmental sciences that were generally designed to generate “false negatives” (ie stressors that are initially regarded as harmless).

4 Foot note See “Late Lessons from Early Warnings: the Precautionary Principle 1896-2000”, Eea 2001.

The EEA “Typology of Indicators” framework (see box) was proposed as possibly useful for developing the CHE indicators.

Box 1 THE EEA TYPOLOGY OF INDICATORS

Type A: Descriptive indicators that focus on “What is happening to the state of children’s environments and to the states of action for improving them? (eg Nox emissions; policy progress indicators on lead free petrol.)

Type B: Performance indicators that focus on why descriptive indicator trends might be of concern in relation to scientific or policy targets. (e.g. air pollution exceedances above air quality guidelines.

Type C Ecoefficiency Indicators that focus on whether we are reducing environmental impacts per unit of economic activity. (Eg Nox emissions per GDP. eg Type D: Policy Effectiveness indicators that focus on whether policies are working (eg the relative contributions of fuel content specifications, catalytic converters and differential taxes on lead free fuels to the reduction in airborne lead from vehicles Type E Total Welfare Indicators that focus on whether we are on the whole better or worse off. (e.g. “green GDP” indicators). Presentation by participants.

Dafina Dalbokova (WHO ECEH, Bonn Office)

"EH Indicators for the WHO European Region: Experiences in Children's Environment and Health"

WHO, working in collaboration with 22 Member States, EEA and EC DG SANCO prepares a methodology for an information system to support environmental and health decisions across Europe. It will be proposed for endorsement by the Ministers of Environment and Health at the Fourth Ministerial Conference (Budapest 2004), for European region-wide implementation. The activities aimed to combine dispersed results, experiences and analyses, into a comprehensible and practical framework. It has already defined indicators for specific environmental health problems, created and managed, on a pilot basis, databases and information, and mechanisms of reporting and communication.

The 'core' of the system are the environmental indicators. The scope of the indicator system – ten topics, selected according to the guidelines of a multidisciplinary steering committee and a review of 34 NEHAP programmes - provides a balanced and comprehensive picture of the most relevant health environmental issues and of a straightforward utility for a policy action across Europe. The topics are: ambient and indoor air quality, housing conditions, road accidents, noise, radiation, waste and contaminated lands, water and sanitation, food safety, chemical emergencies, workplace. The proposed indicators are interlinked according to a clear system structure, based on the DPSEEA model, thus enable effective communication to the policy-makers, on how each part of the information is related to the various processes (environmental risks and health determinants, population health effects, actions).

The methodology has been developed through intensive discussions at WHO technical meetings and consultation with participating Member States. 16 Member States (Armenia, Bulgaria, Czech Republic, Estonia, Finland, Germany, Hungary, Latvia, Lithuania, The Netherlands, Poland, Romania, Russian Federation/Sverdlovsk Region, Slovakia, Spain, Switzerland) volunteered to test the methodology for feasibility and usefulness in national context, and accepted it through a broad multinational consensus. Participating countries also adopted a set of 'core' European environmental health indicators allowing assessment of the environmental health situation and simultaneously demonstrating how a health problem is/should be handled by active interventions (overview of the EH indicator core set in Table).

Table 2 TO OVERVIEW THE SET OF 'CORE' EH INDICATORS IN THE DPSEEA (DRIVING FORCES – PRESSURES – STATE – EXPOSURE – EFFECT – ACTION) CAUSE-EFFECT CHAIN FRAMEWORK

<i>EH issue</i>	<i>Driving Force</i>	<i>Pressure</i>	<i>State</i>	<i>Exposure</i>	<i>Effect</i>	<i>Action</i>
<i>Air Quality</i>	passenger transport demands; fuel consumption and road transport	Emissions of air pollutants		Population exposure to air pollutants (urban)	Infant mortality Respiratory diseases; Mortality respiratory diseases; Mortality diseases of circulatory system	Policies to reduce ETS exposure
<i>Housing and Settlement</i>			Living floor area	Population living in Substandard housing	Mortality due to external causes in children under 5 years of age	Building Regulations for housing Land use, urban planning regulations
<i>Traffic Accidents</i>					Mortality from traffic accidents; Injuries by traffic accidents	
<i>Noise</i>					Population annoyance by sources of noise; Sleep disturbance by sources of noise	Application of regulations, restrictions and noise abatement measures
<i>Waste and Contaminated Lands</i>		Hazardous waste generation	Contaminated land sites			Hazardous waste policies
<i>Radiation</i>					Incidence of skin cancer	Effective monitoring of environmental radiation

Table 1 continues...

<i>Water and Sanitation</i>		Waste water treatment coverage	Exceedance recreational water limits – microbiological; Exceedance WHO drinking water guidelines – microbiological; Exceedance WHO drinking water guidelines – chemicals	Access to safe drinking water; Access to Adequate sanitation	Outbreaks of water borne diseases; Diarrhoea morbidity in small children	Effective monitoring of recreational water
<i>Food Safety</i>				Monitoring chemical hazards in food: potential exposure	Food-borne illness: Outbreaks; Food-borne illness: morbidity	General food safety policy; Effectiveness of food safety controls
<i>Chemical Emergencies</i>		Sites containing large quantities of chemicals				Regulatory Requirements for land-use planning; Chemical Incidents register; Poison centre service; Medical Treatment guidelines; Government preparedness
<i>Workplace</i>					Occupational fatalities; Work-related injuries	Statutory reports of occupational diseases

The core set of EH indicators are currently under testing vis-à-vis the EC legislation for applicability to support policies and actions on health protection and risks prevention across the EU. Main features of the EH indicator system are as follows. It combines both 'top-down' (international to local) and 'bottom-up' (local to international) approaches. Through the built-in system of international comparisons, the effects of the national efforts can be compared with the situation in the other participating countries. The proposed EH indicators enable population-focused assessments at different geographical scales (local/urban, district, state, etc) as many of the environmental risks appear in particularly localised settings e.g. exposure to air, noise pollution. At the same time, the system supports meaningful decision-making at 'central' level with information, empowered to set up the national political and legal agenda.

The EH indicator system uses the existing routinely collected data and statistics, accessible from the regular monitoring networks and health surveillance at different levels (e.g. national, regional, municipal). For the generation of the information, the WHO project has developed specialized software 'EuroIndy', to serve as a basic technical infrastructure to a network for environmental health data exchange both at sub and international levels. It also enables integrating health and environmental data within the national reporting system and a uniform information processing and analyses at national level. The WHO project selected a set of well-established survey methods to be implemented for EH surveillance with a focus on children and the living environment (indoor air, respiratory health, and housing) to complement the existing routine statistics.

The main reporting tools and mechanisms, allowing the most effective use of collected evidence in the process of policy analysis and environmental health decision-making, are presently tested. The EH indicator fact sheet model enables a clear and standard format of communication to respond to the needs of policy-makers. Fourteen Member States volunteered to pilot test the proposed indicator system by applying the methodology to:

- establish the national EH databases and data exchange;
- test the methods of data presentation and analyses;
- prepare the demonstrative indicator report for the Budapest Conference.

The WHO European Region's initiative already selected a number of core set indicators to specifically address children. The work on CEH indicators should benefit from the experience and the methodology developed throughout the WHO/Europe EH indicator process and to coordinate efficiently the efforts to contribute, within the broader WHO

framework, to the policy-oriented EH monitoring system. The latter will be applied, in particular, to the CEHAP, which requires a strong information support to insure that the declared actions are implemented and benefit children's health.

Eva Rehfuss (Sustainable Environments for Health, WHO/HQ)

"The WHO Global Approach to CEH Indicators: the aims and objectives of developing a framework for CEH indicators with a global perspective are in line within the Regional approach to CEH indicators in Europe."

These are 1. to provide a basis for assessing environmental risks to children's health, in order to help prioritise policy at national and global level, 2. to act as a basis for monitoring and evaluating the effectiveness of national and international initiatives to reduce environmental health risks for children, 3. to provide a template for developing other indicators, according to need, to address issues of specific local or national concern, and 4. to contribute to the assessment of the global and national burden of environmental disease for children.

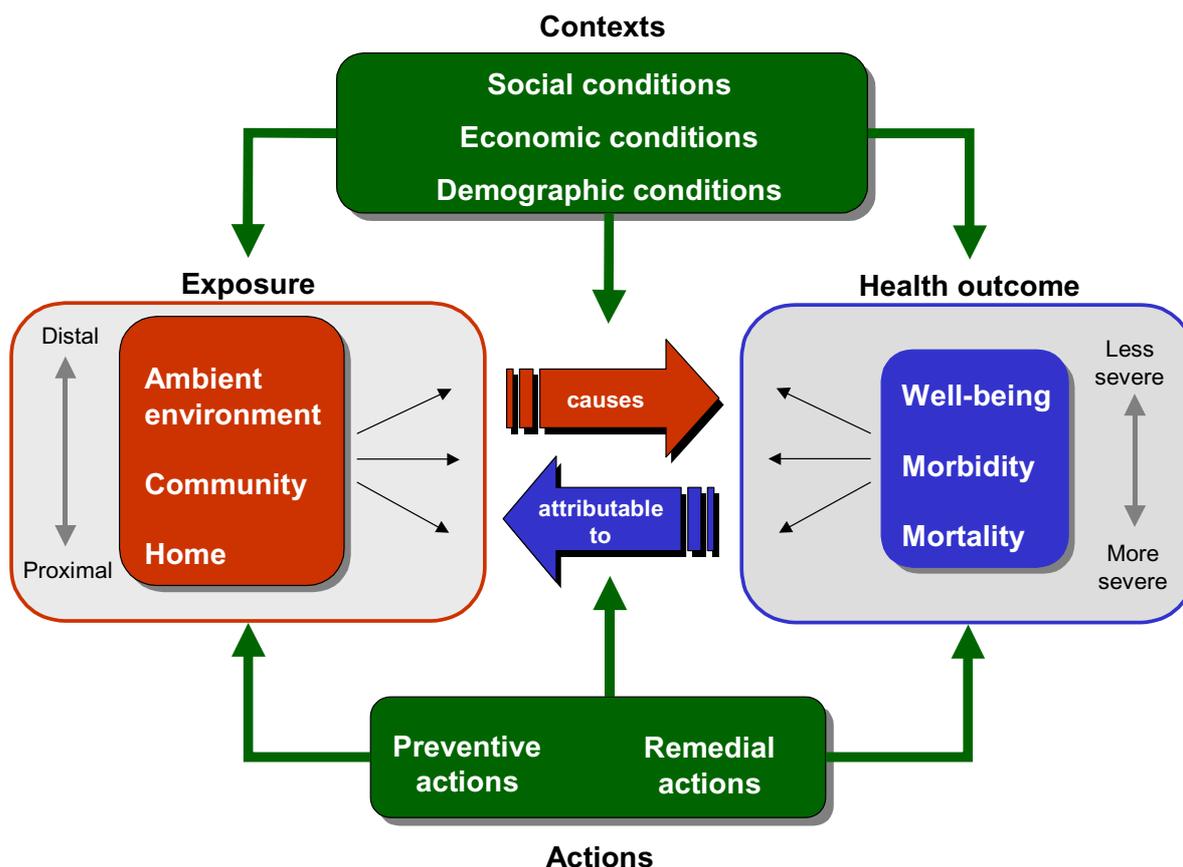
The proposal for global CEH indicators is based on a participatory process that was initiated in 1995 with the WHO framework of environmental health indicators. In 2000, a preliminary list of CEH indicators was generated by an expert consultation and refined through further review in 2001 (WHO Regional Offices, U.S. EPA, NAFTA Commission on Environmental Cooperation, UNICEF, UNEP and others) and 2002 at the WHO Bangkok Conference on CEH. A review of indicator profiles by technical experts in the health and environment fields is planned for Aug – Nov 2003. A technical document consisting of 3 parts (executive summary, concepts and principles, indicators profiles) is in preparation and shall be launched under the Healthy Environments for Children Initiative in April 2003. Further plans include pilot studies and training workshops to be carried out in different countries through Regional Offices.

Challenges in the development of a CEH indicators framework relate to the complex associations between environment and health (e.g., problem of confounding), and the lengthy chain of environment and health associations. Whereas proximal factors are most apparent or stronger, distal factors are often more amenable to influence. Additionally, priority issues vary between places and between users/observers, and data quality is often insufficient.

The earlier DPSEEA framework considers the following pillars for indicators: 'driving forces', 'pressure', 'state', 'exposure', 'effect', as well as related 'action indicators'. The newly developed MEME Model instead focuses on the specific needs of CEH indicators. This model

accounts for 3 types of environments where exposures are of relevance for children: home, community, and ambient environment. Context indicators that impact directly on exposure and outcome are considered, as well as the relation between these. Action indicators play a role at all steps.

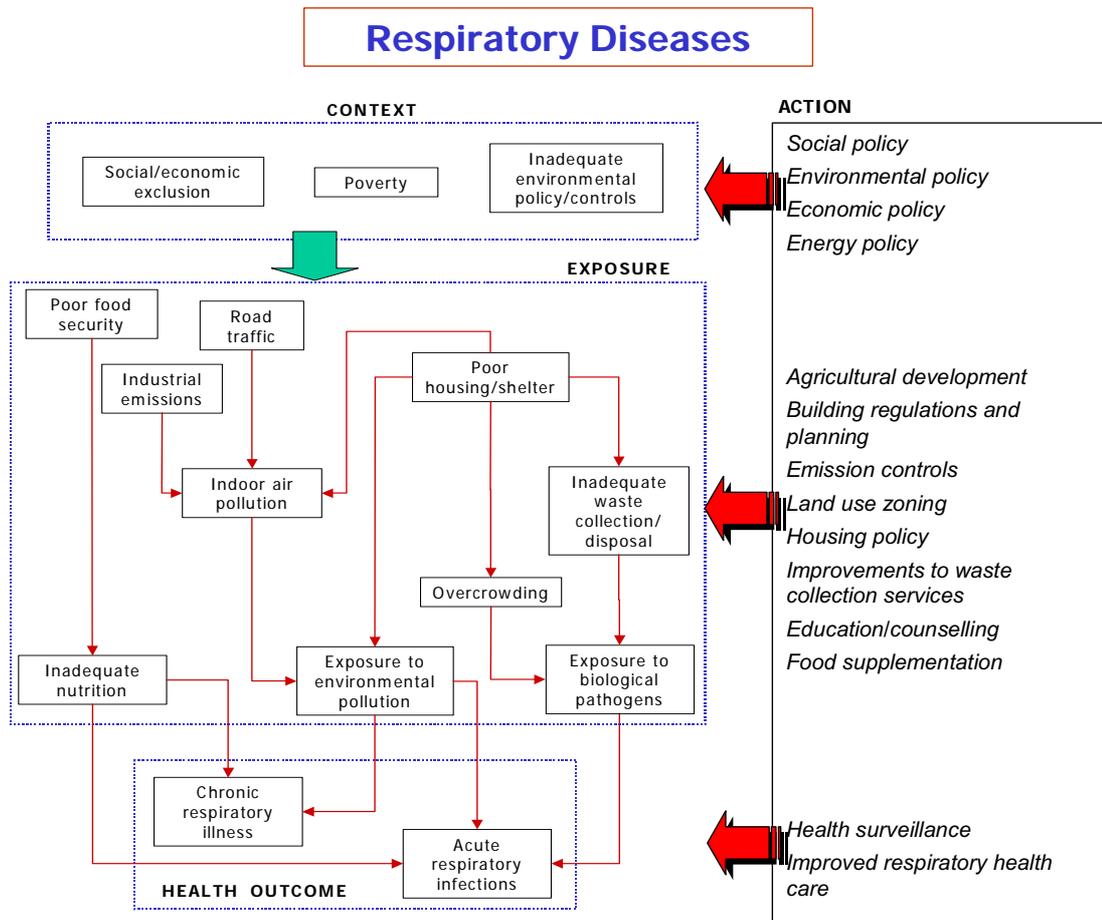
Figure 1 THE MEME MODEL



The global proposal has a health outcome perspective, based on the global burden of disease in children; the main areas consist of perinatal diseases, respiratory illness, diarrhoeal diseases, insect borne diseases, and physical injuries. The risk factors are divided into the following sections: housing and shelter, water supply and quality, food safety and supply security, sanitation and hygiene, solid waste, indoor/outdoor air pollution, hazardous chemicals, accidents, natural hazards, disease carrying vectors, social/work environments. Multiple relations between the above risk factors and health outcomes are considered. Application of the MEME model to respiratory diseases is shown in the figure below.

The technical document presents the indicators profile, which includes the description of the indicators within a given area, the data needs to populate each indicator, and the potential data sources.

Figure 2 APPLICATION OF THE MEME MODEL TO RESPIRATORY DISEASES



In practice, users should define – based on their priorities and conditions – their information needs (scoping). On this basis, an appropriate framework and a list of indicators should be selected (selection). In a next step, detailed indicator definitions should be developed taking into account data availability (design).

For indicators to be effective they must be embedded in regular surveillance and monitoring systems. Current opportunities on a global level are the US EPA type II initiative to develop CEH indicators launched at Johannesburg World Summit on Sustainable Development, the WHO/Europe/EEA Initiative to monitor CEH indicators and develop a period CEH report, and the NAFTA Commission on Environmental Cooperation initiative to publish a report on North-American CEH indicators.

Discussion

In the discussion that followed, participants highlighted the following points as needing further attention or consideration:

- The need to introduce economic indicators and compare costs of action (to prevent adverse health effects) vs. non-action.
- The need to include prenatal exposures in the global approach.
- The importance of focusing on health indicators related to environmental exposures since these are most relevant to policy makers.
- The risk of misclassification and confounding of health indicators that could result in "false negatives" (no effect measured on health status indicators).
- Clarification on what is meant by the term "evidence-based" as there are many environmental situations where there is no "evidence" yet approaches for dealing with this (ie. Precautionary principle) exist.
- What to do if evidence is not strong but the economic impact is large (ie. as in air pollution)
- The need for indicators to show the economic cost if you do not have evidence.
- The proposal to include economic measures in indicators.

SESSION II: Environment and Children's Health Indicators & Reporting: What is Already there in different Countries and Agencies

Presentations by country and agency representatives:

Ruzena Kubinova (Environ. Health Center, National Inst. of Public Health, Czech Rep.)

"Environment and Children's Health Indicators in the National Institute of Public Health Prague"

In the Czech Republic, measures of children's health are implemented as part of the established nationwide Environmental Health Monitoring System. In this context, children represent a susceptible population subgroup. Assessment methods used include incidence/prevalence studies or screening surveys, including biological monitoring. Outcomes (e.g., allergies) or exposure (e.g., food/urban soil contamination, indoor air pollution) are assessed using specific surveys which include detailed assessments of possible confounders, or modifying factors. Possible correlations between health outcomes and environmental factors and time-trends are analysed. Study samples are selected from urban areas.

Experiences from the surveys show that standardised outcome definitions, for example, of allergic diseases, are a problem but results from appropriate surveys are of higher accuracy than data from insurance office records. Biological monitoring should be performed every 1-3 years whereas the allergic disease surveys can be repeated every 5 years. Priorities in monitoring need to be adjusted according to changing exposure risks. Representative samples from urban and rural areas should be considered.

Reporting of results of population surveys is done annually available in print version and for the purposes of the research and library sectors, also on CDs as well as on the internet, which is dependent on individual possibilities for access. In addition to the measurements taken from the surveys, selected child health and demographic indicators are regularly assessed through the Institute of Health Information and Statistics.

Asa Ahlgren (The National Board of Health and Welfare Socialstyrelsen, Sweden)

"Swedish Environmental Health Report (2001/2005)"

An annual assessment based on a random population sample (regularly: 19 -81 years) is carried out in Sweden as the basis for the Environment and Health Report in order to describe and quantify the health status of the population in relation to the environment. Environmental issues considered include those with an established relation to health

outcomes, as well as those with a likely and suspected relation to health outcomes. Topics include housing, annoyance by environmental exposures, health outcomes, and others.

These assessments have shown that although knowledge on how the population experiences the environment is obtained, suitable for monitoring regional and time trends, information on exposure – response relationships is not provided by these assessments. The question of cost-effectiveness is unclear. In 2003, the National Environment and Health report will focus on children (age 8 months, 4 and 12 years). The report will include clinical examination and long-term follow-up of subgroups. Topics will include the indoor and outdoor environment and children's workplaces.

Peter Rudnai (Jozsef Fodor National Center of Public Health, Hungary)

"Overview of children's environmental issues in Hungary and evidence of environmental contamination from various toxicants as monitored by the National Institute of Environmental Health"

The protection policies implemented over the last years, particularly with the introduction of lead-free petrol, have led to decreases in lead contamination, reflected in blood levels now below 10 micrograms per dl. However, sources of lead contamination are still present, including industrial emissions and building materials. Furthermore, water contamination by arsenic was found to be linked to increased rates of abortion and stillbirths in the period from 1975 to 1985. After remediation in settlements there were improvements in such rates. Percent of children with blood lead levels above 10 micrograms/dL, measures of reproductive health such as spontaneous abortions, stillbirth, small birth weight and congenital malformations as well as methaemoglobinaemia are suggested for inclusion in the list of CEH indicators.

Risa Smith, Mark Raizenne, Sabit Cakmak (Health Canada) and Julie Charbonneau Phil Blagden, Kerri Henry (Environment Canada)

"Children's environment and health indicators – the Canadian context and current initiatives"

In the Canadian context the approach to CEH indicators includes enhancing the scientific basis for action, enhancing the monitoring and surveillance system, ensuring easy access to information, development of indicators and indices, and ensuring feedback to policy makers. Responsibilities for environment and health are shared between federal and provincial governments. Partnerships between federal, provincial and local municipalities are considered as key to the development of Canada wide standards, as they already exist for some environmental exposures, such as fine particulate matter, ozone ground levels, benzene, etc (see <http://www.ccme.ca/>).

Federal regulations and international commitments such as Type 2 initiative, CEC, HEMA, and G 8 provide the framework for the implementation of CEH indicators in Canada. National commitments have been made in the areas of air, water, toxics, climate change, and other voluntary sectors, and indicator initiatives are going on simultaneously in many sectors (e.g., Environment Canada Indicators series, National Roundtable on Environment and Economy) and on different levels (international, regional, across boundaries). Canada wide environmental monitoring data are available for acid rain, air quality index, wet sulphate deposition, and municipal waste water treatment. Different national monitoring networks are involved in the reporting, such as the National Air Pollutant Surveillance Network, Municipal Water Use Database, National Pollutant Release Inventory, and others. Contributing information systems include the Canadian Institute for Health Information (CIHI), Canadian Information System for the Environment (CISE) and others.

The Canadian experience shows that the science base, public support and recognition, and linking of the health and environment sectors are crucial for action. Building on existing initiatives also avoids duplication of efforts and is cost-effective. International fora have also played an important role in moving the domestic agenda.

**Tracey Woodruff, Martha Berger, Ed Chu and Bill Sonntag
(US Environmental Protection Agency, United States)**

"Developing Measures of Children's Environmental Health at the United States Environment Protection Agency"

In 2000 the first CEH report, America's Children and the Environment: A First View of Available Measures, was published based on readily available data and information that was pulled together in one place (measures vs. indicators). The first report was based on preliminary measures and was then consulted with peer reviewers and stakeholders. The 2nd edition of this report, America's Children and the Environment: Measures of Contaminants, Body Burdens, and Illnesses is currently in press. The report is based on expert recommendations for improvements/additions and introduction of new measures, and has gone through internal and external peer review.

A classical framework was applied: state (environmental contaminants), exposure (body burdens), and effects (disease outcomes). Other social determinants or driving forces are not included. Environmental contaminants, blood levels (lead) and illnesses with some relation to environmental exposures (e.g. asthma) are considered. Measures are selected based on the following criteria: relevance to children's environmental health and availability of nationally representative data. Additional data on differences by race/ethnicity and income

and State-level data for some measures were included. The peer review panel identified the following additions: environmental contaminants (criteria air pollutants, mercury in fish), bio monitoring (cotinine in blood, mercury in blood), illnesses (additional respiratory effects, neurodevelopmental disorders), and a new section: "Special Features", which features selected data by state.

Opportunities and challenges exist in the measurement of progress, areas of intervention, illustration of data needs, and improvement in incomplete measurements. The choice of measurements is a technical and political decision. For this reason, it is suggested to have a rather broad net rather than leave things out.

The process to first develop a proposed set of indicators, then review these with stakeholders was efficient and it is suggested to start with a core set of indicators that most will agree to, and add other measures for future development in selected areas it will be recalled in the final discussion points

Box 2 SUMMARY OF US EPA CEH INDICATORS EFFORTS.

US EPA CEH indicators efforts

America's Children and the Environment Report

Environmental Indicators Initiative: Five theme areas: human health, ecological conditions, clean air, pure water, and better-protected land. Indicators of children's environmental health are covered in the human health section

State of the Environment Report

The US EPA has also contributed to the WSSD Type II Effort: Launched by Administrator Whitman in Johannesburg. Partners include WHO, UNICEF, UNEP, NAFTA CEC, and OECD. NGO participation came from PSR, INCHEs, and ISDE. Countries involved in the Type II Effort are Italy, Mexico, Canada, and South Africa.

Ed Chu (US Environmental Protection Agency)

"Activities of the Commission for Environmental Cooperation"

The Commission for Environmental Cooperation's (CEC) (May 2000) calls for the development of CEH indicators in Canada, USA, and Mexico, with focus on four priorities: asthma and upper respiratory illnesses, lead poisoning, effects of toxic substances, and waterborne illnesses. In 2002, a feasibility Study was conducted by the Canadian Institute of Child Health in cooperation with PAHO, WHO, OECD, and others. The purpose of this exercise was to identify relevant, ongoing activities and useful data sources in the three countries, to outline potential options for developing CEH indicators in North America, and to recommend a "core set" of indicators. The challenge is to develop a flexible but consistent approach that serves the specific needs of the countries involved. Frameworks under discussion include the DPSEEA and a layered approach (that allows each country to identify and collect indicators for each priority area). A focus on CEH indicators is strongly supported.

Some early lessons show that the purpose of the indicators and the priority issues must be clearly defined and the focus should be on issues rather than on identical indicators. Further, a clear definition of 'environment' is required with a suggested focus on the impact of the physical environment on CEH. The link between environment and health outcomes should be demonstrated, and the inclusion of economic" indicators is recommended. A sharp focus on CEH issues/indicators is necessary, since the addition of driving force, pressure, state indicators may be burdensome for the CEH effort. The first CEC Indicators Report is expected in 2003.

Kathrine Johnson (UNEP/GRID-Arendal)

"UNEP's involvement in children's environment and health issues and possibilities to contribute to WHO/EEA CEH indicators initiative"

UNEP has been active in children's environmental health issues, working closely with UNICEF, WHO, governments and NGOs. Activities include the co-publication of the booklet, Children in the New Millennium (www.unep.org/ceh/), participation as a core partner in the Healthy Environments for Children Initiative, the US EPA type II initiative on CEH indicators, the Canadian type I initiative on Environmental Linkages, the Health and Environment Ministers of Americas initiative, the European Environment and Health Ministerial Conference in 2004, and in the 3rd International Conference on Children's Environmental Health in Nairobi 2003.

UNEP is further involved in projects on indicators and the State of the Environment reports in Europe, Cities Environment Reports on the Internet (CEROI), health and

environment information on indigenous peoples in Arctic Russia, national state of the environment reports, and other regional activities, in cooperation with the EEA and the Arctic Council.

UNEP could offer substantial support based on their experience on environmental information and indicators to the WHO/EEA CEH indicators initiative in the European Region.

UNEP's contribution could include:

- Assisting in environmental information, monitoring and assessment (including indicators);
- Use experience in bridging the gap (producing information for decision-makers: SoE reports, newspaper, maps and graphics);
- Work in the area of outreach and dissemination of material developed within the project;
- Web based solutions.

Michael Rigby (Keele University)

"The EU: Child Health Indicators for Life and Development CHILD project"

The Child Health Indicators of Life and Development (CHILD) project completed its work and reported in September 2002. The project comprised representatives from seventeen countries – all fifteen Member States of the EC together with Iceland and Norway from the European Economic Area (EEA). The project was undertaken and funded as part of the European Community Health Monitoring Programme, operated by the Public Health function of the Health and Consumer Protection Directorate-General of the Commission.

The remit of the project was to identify a set of indicators to measure child health and child health services at a national level. This related to the Commission's competence in health, which is limited to the national level, as delivery of health care services is a member state responsibility.

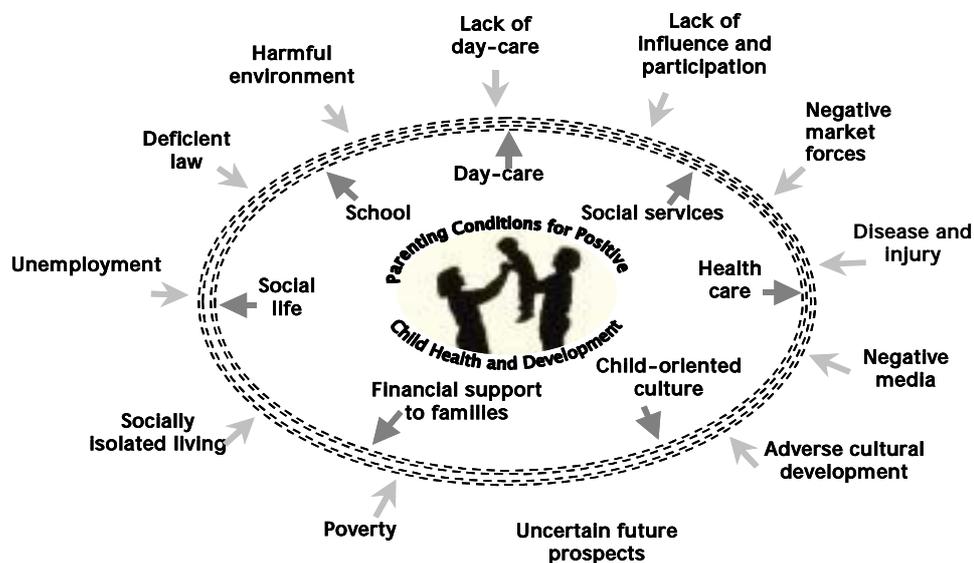
The project established a target only to recommend indicators based on scientific evidence demonstrating that the measure was valid in measuring the health aspect, was comparable across all countries, and for which data was likely to become available. The project also set out to give strong emphasis to health determinants as a high priority, as well as to health status and health services, in order to identify positive issues in the protection of health in children. The final report and recommendations was sent to the European Commission in September 2002 (Rigby & Köhler 2002).

The work was divided into a set of topics, for each of which a systematic approach was adopted. This method was firstly to study the literature, from which to identify the issues which were important, assess the measures which might be used, and from these to collate in initial longer list of potential indicators. From this initial evidence-based list, a structured filtering process was devised to identify the most robust indicators. Factors taken into account in this process were the burden of disease for each topic (burden to society, to the family, and to the child including life-long effects), amenability to effective action, and data availability on a regular basis. Additional factors alongside these were the technical validity of the possible indicators, the cross-European comparability, and ensuring a balance across all dimensions of child health, giving equal weight also to measuring both positive and negative aspects of the health environment.

The CHILD Project recommended 38 indicators covering the complete span of childhood and adolescence from the post-neonatal stage, and covering health and illness, health services and health behaviour, and a range of health determinants. The project also identified 18 aspects which it felt to be very important, but for which it could find no scientifically validated indicators which met its criteria as described above, and for which it indicated that further research work was needed.

Environment was seen as an important aspect, but also a challenging one in terms of defining meaningful and comparable indicators of child-related environmental health determinants at national level, and which had similar meaning and significance across the whole of Europe. The Project has recommended five environmentally-related indicators, covering air pollution, road transport safety policy, protection against lead in buildings and decorating materials, harmful noise, and exposure to environmental tobacco smoke in public places. In each case the recommendation is for a multi-dimensional composite indicator, an approach only used in this dimension of the report. These recommendations will also require new innovative analyses of combinations of specific datasets, though standard contributory measures and data definitions are employed.

Figure 3 THE BREADTH OF HEALTH DETERMINANTS COVERED BY CHILD



Adapted by Gunnlaugsson G and Rigby M from Skolh ls v rden 1998. Underlag f r egen kontroll och tillsyn. Stockholm: Socialstyrelsen, 1998.

Eva Steliarova-Foucher (International Agency on Research on Cancer)

"The Automated Childhood Cancer Information System (ENCR, EUROCARE)"

The Automated Childhood Cancer Information System (ACCIS) provides access to the European database of cancer cases occurring in childhood and adolescence (patients under 20 years of age). This database contains information on 160,000 cancer cases arising in 2.6 billion person years and registered in almost 80 population-based cancer registries in 30 European countries over the last 30 years. Available information include, for each case: identification (registry, tumour code, etc), tumour (site, morphology, etc.), and follow up (date of death, last contact, etc.). Data are systematically validated. The collected data are presented in statistical analysis software ACCISpass, and selected results are also available on the Internet (<http://www-dep.iarc.fr/accis.htm>). ACCIS provides standardised indicators of the cancer occurrence (incidence rates) and outcome (survival) in the young European populations.

Remigijus Prokhorskas (WHO/Europe)

"The Health for All Database"

The European health for all database (HFA-DB) contains data on about 600 indicators broadly covering various aspects of population health and its determinants. All indicators are organized according to the following groups:

- . demographic and socioeconomic statistics
- . mortality-based indicators
- . morbidity, disability and hospital discharges
- . lifestyles
- . environment
- . health care resources
- . health care utilization and costs
- . maternal and child health.

A number of these indicators can be directly or indirectly linked to the children and/or environment-related issues. The database includes data for 51 WHO Member States in the European Region and covers the period from 1970 to the latest year for which data are available. Data availability and comparability may be limited for some countries and/or indicators. The data are regularly collected by the WHO Regional Office for Europe from various sources and updated versions of the database are issued twice a year, in January and June.

The user-friendly software allowing easy and simple access to the data and the output display in the form of easy understandable graphs made the HFA-DB popular even among users with limited skills in computer use. The main purpose of HFA-DB is to serve WHO Member States (national administrations, health professionals, researchers, mass media, students, general public, etc.), also other international organizations and users, with the health data which they may need for the analysis of health situation in a particular country or in Europe as a whole.

Peter Bosch (European Environment Agency)

"The National Environment and Health reporting system"

The EEA is involved in the development of national repositories of data that feed into international data systems. The reporting obligations agree with international conventions or WHO data reporting systems. The system is available online and the status of the different

reporting countries can be observed. Data exchange modules, including data entry diagrams can be found at www.eionet.eu.int

Specific indicators are being developed for monitoring policies within EU. The presentation highlighted the following discussion points:

- Difficulties of inserting non-standardised data sets;
- the need for data development “de novo”;
- the need to derive data from modelling or calculation techniques;
- Importance of being realistic since the development of a core set of indicators can increase feasibility;
- Ownership and sharing rights of data needs to be considered;
- Establishing working relationships is useful to ensure that national data collection systems harmonise over time.
- The participants highlighted the following points in the discussion that followed:
- The need for indicators to be sensitive and consider developmental effects rather than only illnesses or specific statistics of diseases.
- The suggested inclusion of spontaneous abortions, stillbirths, congenital malformations, and Methemoglobinaemia in the list of CEH indicators.
- The need to include time to pregnancy as an indicator.
- The need to expand the focus beyond the most apparent diseases to catch the spectrum of public health problems.
- The need to and means of measuring the economic impact of environmental diseases in children.
- The existence of indicators towards political measures and attempts to model health impact of environmental exposures have been made.
- The issue of how to get beyond the data that is not standardized and not available in some countries.

SESSION III: WHO/Europe/ECEH Rome CHE Indicator Proposal and Working Groups

Giorgio Tamburlini (WHO/Europe, ECEH Rome)

"A Preliminary proposal on CEH indicators for the European Region"

Several UN agencies have developed indicators for child health and for generic environmental health. WHO/Europe, with the involvement of many international experts and the direct involvement of MS, has developed a detailed framework of EH indicators, including a comprehensive list of indicators. WHO HQ has recently started to develop CEH indicators within the framework of the Global Alliance for Healthy Environments for Children (HECA). CEH indicators have been produced and used at country level in both the US and Canada. Within the European Commission's Health Information (ECHI) framework, the CHILD project covered some environmental health issues. Thus, it is necessary to build on the existing knowledge and already existing proposals keeping in mind that the field experience in this area is still very limited.

There are several conceptual approaches for developing CEH indicators: a **risk factor (exposure) approach**, looking at the main route of exposures (air, water and sanitation, chemicals, etc.); a **health outcomes approach**, based on the contribution of environmental factors to the main childhood diseases (respiratory diseases, diarrhoeal diseases, congenital malformations, perinatal conditions, insect-borne diseases, injuries etc.); a **settings approach**, looking at main hazards in the various settings where children spend most of their time (households, day care and schools, playground and leisure activities, workplaces), which has the advantage of emphasising the need for a setting, based approach to environmental protection and a **developmental stages approach**, looking at specific environmental hazards in various stages (reproductive period, pregnancy, birth and first years of life, school age, adolescence)

Although each of the above approaches has some advantages, the first is the most widely accepted, and along with the second, has the advantage of allowing for identification of priorities based on current BoD data. However, all 4 perspectives are useful for identification of focused protection policies. For example, there may be an interest developing indicators to assess policies for pregnant women, or for adolescents in working places, or to monitor issues at school level.

The proposed approach is based on environmental exposures\risk factors, and is therefore consistent with the WHO/Europe EH indicators project, with some slight differences

in the grouping of indicators and a specific focus on adverse social environments. Besides consistency with the existing WHO/Europe proposal which has been already tested in several countries, this approach allows for linkages with the BoD and comparative risk assessment study. Although precise information is not currently available for all the known environmental risk factors for children in the European region, this undoubtedly represents a necessary future direction of work to identify priorities. The justification of the inclusion of specific social environments is that there are some specific environments and situations such as is the case for institutionalised children, street children and children in working places where there are specific hazards for their mental and physical well-being. The latter situations are of increasing importance in the European Region, particularly in CE and NIS countries.

According to this approach, indicators could be framed according to an exposure/health status/ action framework, which represents a simplified version of the DPSEEA and closely resembles the MEME approaches adopted in the WHO HQ document. Context indicators will complete the picture allowing to interpret the existing information in relation with different socio-economic scenarios.

Based on this approach, and considering the fact that indicators are essential tools for the development and monitoring of CEHAPs, and therefore should first, promote and monitor action, we propose to:

1. give special emphasis to action indicators;
2. identify health outcome indicators which a) are available in existing health information systems, and b) can be influenced by changes in environmental exposure and potentially by policies; and
3. identify those exposure indicators which a) are available from existing data sets or with minimal adjunctive effort (such as by better use of existing household or school surveys) and b) describe the most important exposures.

Table 3 SYNOPSIS TABLE OF THE PROPOSED CEH INDICATORS. *CONTEXT (PRIMARY DETERMINANTS) INDICATORS ARE LISTED BELOW.*

Environ. Issues	Exposure indicators	Health Status Indicators	Action Indicators
Air	Exposure to PM10 > 40µg/m ³ * Exposure to biomass fuel * Exposure to ETS at home*	IMR* under 5 MR* RI under 5 (MR)* Hospital admissions for asthma 0-18 years	PP to reduce exposure to IAP (BMF & al.)* PP to reduce exposure to ETS* PP to reduce exposure to hazardous OAP
Water, sanitation & Housing	No access to basic W & S* No access to quality water* Inadequate housing *	IMR* Under 5 MR* DD under 5 MR*	PP to improve access to W&S and to quality water PP to ensure safe housing* PP to reduce home accidents*
Nutrition & Food	Breastfeeding * appropriate diet intake*	% LBW* % underweight* % stunted* % overweight, obesity* % anaemia	PP to improve food availability and appropriate dietary intakes* PP to improve infant food safety*
Mobility & transport	Physical activity*	IMR* Under 5 MR* External causes MR* under 5, 5 to 18 Hospital admissions for road accidents, 0-18 yrs	PP to increase road safety* PP to promote safe mobility & physical activity*
Physical and Chemical Agents	Exposure to hazardous noise at school UV index Radiation exposure Biomarkers (Lead, PCBs) Environmental disasters & climate change	Lead poisoning, acute Melanoma, incidence 15-25 years Incidence of childhood cancer*	PP to protect reproductive period, childhood & adolescents from exposure to hazardous chemicals PP to reduce exposure to noise in schools and residential areas PP to reduce exposure to UV PP to develop emergency preparedness.
Specific adverse social environments	Abandoned children* Institutionalised children* Child labour	Violence and suicide under 5, 5 to 18 MR* Violence neglect and abuse Accidents at work < 16 yrs	PP to prevent abandonment & reduce institutionalisation* PP to improve child protection policies* PP to reduce exposure to hazardous working conditions*

*Legend: * core list, PP = policies and programmes, IAP = indoor air pollution; OAP = outdoor air pollution*

Many of the above indicators are already included in existing WHO data sets or in WHO EH list, others have to be either modified to cover the need of children, or to be introduced *ex novo*.

The core list* is meant to cover the main environmental hazards for children across the region and assumes that the relevant information can be derived from existing sources or with little additional effort in most if not all Member States. The extended list includes indicators, which either cover issues that represent priority CHE issues only for a minority of Member States, or require rather sophisticated measurement or data collection techniques that may be feasible in only a few countries. This is intended to allow a flexible approach to take into account the differences in priorities and data availability in different countries. Unless otherwise stated, denominators refer to the total children's population (defined as < 18 years, according to UN).

Further operational definition of the indicators, including technical definitions, thresholds, measurements methodology etc. are to be detailed in a subsequent phase through a process of consultation with all the relevant agencies, experts and WHO programmes (water, air, nutrition, tobacco, transport etc.).

The final product will be a series of technical templates, based on the outline proposed by WHO (see box) including a detailed justification for considering a specific indicator for children.

Box 3 PROPOSED OUTLINE FOR TECHNICAL TEMPLATES OF CEH INDICATORS ISSUE

Justification for a specific CHE indicator.
Technical definition of the indicator:
Underlying definitions and concepts
Data sources: specification of data needed, data availability and quality
Computation and units of measurements
Scale of application
Interpretation
Linkage with other indicators

It should be stressed that establishing linear causal links between exposure and health effect indicators is impossible, since most health effects, particularly those that can be described by means of indicators, have multiple causes and to establish such mechanical links would not be scientifically credible and possibly politically misleading. However, it may be useful to present the proposed indicators according to main areas (as shown in the table), to show the attempt to cover all the main areas.

Socio-economic and demographic indicators (i.e. parents' SES distribution, parents' educational attainment, children in poverty, children living in single-parent households, demographic composition by age group) should be seen as **context indicators**, necessary to complement the picture and to interpret the other indicators. Whenever possible, breakdown analysis of the proposed CEH indicators by socio-economic variables and gender by linking with social and demographic data bases, should be carried out to analyse the distribution of exposures, health effects and policy implementation across social groups and gender. This seems necessary to effectively deal with the issue of environmental injustice.

Working groups

Following the presentation on the WHO/Europe/ECEH Rome CHE Indicator Proposal, participants were divided into three working groups and given a series of key questions to discuss and later present to the plenary.

Question 1 - Conceptual framework:

Several conceptual frameworks have been proposed for the development of environmental indicators (DPSEEA from the WHO/Europe indicators document), children's environmental health indicators (MEME from the WHO HQ document) and child health indicators (from the CHILD project). The WHO/Europe/ECEH Rome proposal puts forward is based on Exposure, Health Status, and Action indicators, with context indicators and SES variables for analysis and interpretation.

***DOES THE GROUP AGREE WITH
THIS APPROACH AND IS THERE ANY ALTERNATIVE OPTION THAT COULD BE CONSIDERED?***

The group felt that the conceptual framework used in the WHO/Europe/ECEH Rome CHE Indicator Proposal was consistent with the Multiple Effects Multiple Exposures (MEME) Model and to the Context, exposure, health, and actions indicators based on the DPSEEA framework.

Overall, it was found to be a valuable conceptual model, also being employed by the AMR, EMR, and AFR regions. The group felt that the emphasis on the Action (or Policy) indicators was useful for policy-makers, but felt the target audience of CEH indicators needed to be clearly identified. There was also a feeling that the criteria for selection of indicators should be clearly stated and flexibility in the choice of indicators and in categorization should be allowed. Regarding the project scope, the group agreed that the definition of "environment" should include the social environment. Concerns about sustainability of the indicator system were raised.

Question 2 - Grouping of environmental issues:

Environmental issues can be grouped into air, water and sanitation, food and nutrition, transport and mobility, chemical and physical agents and social environments. Other groupings have been proposed by European EH indicators and HQ.

***DOES THE GROUP THINK THAT
ALTERNATIVE GROUPINGS MAY BE MORE APPROPRIATE?***

The following modifications to the grouping of indicators were proposed:

1. separate radiation, UV and noise
2. separate physical from chemical agents
3. separate water and sanitation and housing

Question 3 - Selected Indicators:

The preliminary proposal identifies a list of indicators based on existing scientific evidence and perceived importance, availability of data (based on current data sources or with minimum extra cost) and usefulness of the information to inform focused action.

***TO WHAT EXTENT DOES THE GROUP
ACKNOWLEDGE THAT THESE CRITERIA ARE MET
BY THE SUGGESTED LIST AND WHAT MODIFICATIONS WOULD THEY SUGGEST?***

The group found they needed general clarification in the following areas:

- Definition of environment and children's environmental health
- Definition of age group
- Clear rationale for selected issues of importance (scientific vs. political; evidence based vs. perceived; known vs. unknown)
- Grouping of risk factors based on media, type of risk factor or setting
- Understanding of what each issue encompasses
- Link between exposure, health status and action indicators
- How much of health outcome can be attributed to environmental exposure?

Comments on **specific indicators** included:

- The need for consistency (ie. For morbidity assessment, some indicators are highly specific while others are generic).
- The need to clarify that linear causal links between health status and exposure indicators are not being suggested.
- Establishing links between exposure, health and action indicators.
- For air, there should be a threshold level for PM10* [The need to specify biomass fuel*; (coal, kerosene etc)]
- Inclusion of both IMR and cause-specific MR.
- For water, sanitation, policies and programmes (PP) to improve access to W&S and to quality water should instead be water-borne diseases.
- Under nutrition and food safety- the risk of food-borne infections, contaminants, heavy metals (mercury)*.
- Placement of LBW as generic indicator.
- Mobility and transport- exposure to traffic; PP to develop child-friendly transportation.
- For physical and chemical agents, need a clearer definition of/distinction between environmental disasters and climate change; congenital malformations should be included.
- Need an additional health indicator beyond cancer (e.g. reproductive and developmental indicators).
- In reference to the social environment, there was agreement that the proposal only addresses marginalized groups and that this topic should either be addressed in a broader sense or not at all.
- The importance of action indicators and their relevance for policy (potentially very powerful piece of information). The existence of a policy should be indicated using a score system to describe the implementation of policy.
- Consider including action indicators in the extended list.
- The group also stressed the importance of pilot testing by starting off with a few action indicators to test which ones work.

The group also stressed the fact that children are at risk in the pre-natal stage and that it could be useful to look at the pre-conception, the intra-uterine period, early childhood and the later childhood. Depending on the quality of data one could fine-tune these periods. This could fit on top of the suggested method as a separate frame or as an environmental issue box. Emerging issues such as bisphenol A, internal radiation and PCB/dioxins should be considered when taking the intra-uterine exposure into account.

Question 4 - Core and extended set of indicators:

The proposal supports the concept of a core and extended list, based on different needs and the capacities of the information system to produce managed data. The core list represents the minimum data set of indicators that should be available from all countries. The extended list is a more ideal list, and might only be available from some countries but could be extended over time.

***TO WHAT EXTENT DOES THE GROUP
AGREE WITH DISTINCTION AND IS THE SUGGESTED
GROUPING DIVIDED APPROPRIATELY INTO CORE AND EXTENDED LISTS?***

The group agreed on the need for a flexible approach providing countries with options among which to select was is feasible and covers a priority. Core indicators should be indicated as a mean to have a possible set of shared indicators among all countries. When looking at data, different levels of data availability should also be considered such as:

- Data that are needed anyhow.
- Data that are available.
- Data that are not easily available.
- Data that are easily available.

Question 5 - Social environments:

Social and physical environments are both involved in the causal pathways of disease. However social environments are not taken into account by either the European Region proposal or the HQ proposal.

***TO WHAT EXTENT DOES THE GROUP THINK THAT
THIS ISSUE SHOULD BE DEALT WITH BY THE CHE INDICATORS PROPOSAL
AND IF SO, IS THE PROPOSED SOLUTION APPROPRIATE? ARE THERE ALTERNATE SUGGESTIONS?***

The group stressed the need to look and include context indicators such as:

- Child poverty
- Parental education
- Child in a supported household

Possible indicators to add to this list are:

- Child labour
- Institutionalised children
- 1st generation immigrants

The group thought that such context indicators should be matched on a geographical scale with other indicators. To do this correctly, it will be necessary to find out what data in these fields is already currently being routinely collected.

Question 6 - Environmental injustice/inequalities:

Given the striking environmental inequalities among population groups and among children, and the resulting health effects, a crucial issue in developing indicators is to describe the distribution of exposure, the health effects and policy implementation across social groups. Analysis by SES and other proxy variables such as mother's education and father's occupation has been proposed, though there are problems of homogeneity of data collection across European countries.

HOW DOES THE GROUP THINK THAT THE ISSUE OF INJUSTICE SHOULD BE BEST ADDRESSED BY THE CHE INDICATORS?

As far as environmental injustice/inequalities, the group thought that class, race, geographical distribution of harmful factors should fall in this area but it was also stated that other possible areas of environmental injustice such as the right to quality labelling, access to information for disabled persons could be considered.

Panel discussion

The panel discussion provided a forum for questions on the WHO/ECER CEH proposal and on the 1st Euro environmental health indicators pilot report, and the way forward. Following to the reporting from the WG, a panel discussion took place, to represent the views of the different countries and organisations represented at the meeting.

Lillian Corra, ISDE, had concerns that policy development in the field of environmental health hazards was always going to be too late in relation to the rapidly developing child and adolescent. How could new threats be recognized and measured in time to take effective action? What kind of education should we be giving children themselves about environmental hazards, the design of their own future environment, and the design of future cities?

Peter Van der Hazel, INCHEs, stressed that timing of exposure is crucial, both when it occurs in a child's development and the length of the exposure. Pre conception exposure, inter-uterine exposure and post delivery exposure needs to be taken into account and data should be collected on this at the local level to give power to local interested groups. These people are looking for tools that are easy use, so need indicators that can be easily

communicated to local research institutes. We therefore need to obtain the 'end user' perspective as to what their needs for information are. Also need to look at what hazards are affecting the entire population but it is often very difficult to ascertain this in view of the ubiquitous nature of the exposure. Suggested 'hot spot' indicators that can be used for rapid appraisals every 1-2 years. Also highlighted the need for both short and long term indicators and need to take aboard new indicators as the emerge in the future.

Tracey Woodruff, USEPA, said it was very important to focus our initial activities in the field. Have to achieve a balance between what we want to do and what we are able to do. The CHILD project presented in the previous day was an extremely important starting point in this field and had included some environmental health indicators already. The real challenge was going to be getting all the data together in one place at the right time. Also highlighted how useful it was sharing information about what is happening in other countries. Initial powerful step is to collect all the available data in similar format and have it one place. Can then increase database from there.

Kubínova Ruzena, Czech Republic, highlighted the importance of carrying out pilot studies in various European countries to look at the feasibility of data collection as each country had different problems with their data collection and probably collected even routine data in slightly different ways. Also, when collecting environmental data need to think about where children spent most of their time – as children live indoors 80% of the time. What environmental hazards were they exposed to at school? She recommended that WHO should organise a questionnaire for children about their perception of environmental health risks. National environmental health plans should be formally reviewed annually by governments as a tool for effect political change, and politicians would be interested in this.

Peter Rudnai, Hungary, underlined that Hungary is one of the pilot countries for collecting general environmental hazard data. He would like to see these general extended to health indicators specific for children. Need to look at the availability of the data within the public health system and need to link the health and environmental health data at community level and if possible at national level. There is good monitoring data for air, drinking water, air pollution but also need to include data sets collected within and outside the healthcare system such as transport, environmental protection. This information should also be available at community level especially where WHO has the Healthy city program running.

Risa Smith, Canada, said that Canada has strong links with Europe and look to Europe for what we are doing. The area of Children's environmental health is relatively new (2 years) in Canada. Canada has made a commitment to DPSEEA framework but will watch carefully about the emergence of the new MEME framework. Would like their reporting to be in synch with Europe. They are very interested in policy indicators, in particular lessons learned from policy. Encourage focus on policy indicators, especially policies that have been implemented. It is useful for them to report in a framework of 'lessons learned. They have used definition of environmental health as that concerned with the 'physical environment'. In their indicator work they have done a lot of focus groups. Individuals want to know at what point in the concern about a specific indicator *they* can they do something. Consumer perspectives about what *they* can do to effect their environment is important and they want to know that there is some evidence based action to take if they are going to be involved in measurement of outcomes. Would like Europe to report on the economics in relation to changing the environment. What would the changes cost?

General discussion following panel:

WHY HAVE CHILDREN'S ENVIRONMENTAL HEALTH INDICATORS AND WHO ARE THEY FOR?

The indicators are needed because (a) there is a steady increase in environmental hazards (both in numbers and in some cases dose) and many of these are damaging to children's health. (b) children (in utero and thereafter) are more vulnerable than adults to these hazards the younger they are (c) lifetime exposure results in a greater overall final dose. Who are the indicators for? Governments, individual politicians, NGOs, interested communities.

SHOULD THERE BE A MENU FROM WHICH DIFFERENT COUNTRIES CAN USE?

The North American and Canadian experiences suggest that the number of indicators should be kept low, at least initially.

ROUTINE MEASUREMENT AS AGAINST RESEARCH SURVEYS ON SUBPOPULATIONS: HOW MUCH DO WE KNOW ABOUT WHAT IS ROUTINELY COLLECTED AT THE PRESENT TIME? HOW MUCH WILL WE HAVE TO COLLECT USING SPECIFIC RESEARCH SURVEYS? COULD SAMPLING BE DONE IN INDIVIDUAL COUNTRIES AND THE SAMPLES ARE SENT FOR ANALYSIS IN A CENTRAL LABORATORY?

These questions raised the issues of bio-monitoring in a general sense:

For mercury and cotinine, the experience in USA has been powerful tool for moving issues forward. Toenail clippings can be good samples for identifying micro-pollutants. There are over 100 chemicals measured by CDC Atlanta.

Issues for bio monitoring include sampling (sample bias to be avoided), cost, quality (mass spectrometry is expensive and is susceptible to quality issues), ethical issues, and public concerns raised when performing surveys and studies based on bio monitoring. More recent bio- assays will allow the measurement of total dioxin load and estrogen load. Micro-monitoring could be done on blood, fat, other tissue, breast milk, urine, buccal tissue, hair, nails, etc.. A complementary approach to micro-monitoring is the macro-monitoring of chemical production and emissions.

The Economics of action versus non-action on CEH indicators is a large area for development in the future and needs to include a quantification of the total burden of disease. There is still a great deal of political difficulty in this area.

***EVIDENCE THAT PROPOSED ACTIONS ARE EFFECTIVE:
WHAT CRITERIA SHOULD BE USED? WHAT EVIDENCE DO WE HAVE? SHOULD
THERE BE AN AVAILABLE 'SHOPPING LIST' OF EFFECTIVE ACTIONS FOR PEOPLE TO USE?***

Various ways of grouping issues – these need not be mutually exclusive.

One standard way of grouping could be air, water and sanitation, food and nutrition, transport and mobility, chemical and physical agents and social environments. But it is also very important to think about grouping by time period of exposure to indicate the critical importance of the time of exposure, the length of exposure the exposure dose. So both exposure and outcomes could be grouped by pre-conceptual exposure, inter-uterine exposure, exposure during infancy (birth to end of first year of life), exposure from beginning of second year to end of 18th year.

***DID THE CORE AND EXTENDED DATA SET MEET THE
CRITERIA OF EXISTING SCIENTIFIC EVIDENCE, PERCEIVED IMPORTANCE,
AVAILABILITY OF DATA, USEFULNESS OF INFORMATION TO INFORM FOCUSED ACTION?***

On the whole there seemed to be good agreement on this though the feeling that the indicators should be matched up with the other data sets being recommended. Classification of indicators could include 1) available now in all countries 2) may be available in the future in all countries 3) would like to have available 4) will not have available.

***TO WHAT EXTENT SHOULD OTHER ENVIRONMENT FACTORS,
OTHER THAN PHYSICAL AND CHEMICAL E.G. GENETIC, SOCIAL, ECONOMIC
AND OTHERS, BE TAKEN INTO ACCOUNT IN THE CONTEXT OF CEH INDICATORS?***

It was generally agreed that environmental factors should be extended outside the physical and chemical environment, and the social and economic environment was important and needed to be taken into account. This would not entail collecting new data, but could be done by linking with other relevant data sets available in Europe. Further work would need

to be done to examine the linking of data sets using small geographical areas data if it was available.

***HOW DO WE INVOLVE CHILDREN AND YOUNG PEOPLE
IN PRIORITISING THE ENVIRONMENTAL ISSUES. WHAT IS THE COMMUNICATION STRATEGY?***

A version for the public of the monograph published by WHO and EEA should be prepared and tested for comprehension by both parents and young people. The importance of transmitting messages to physicians and the need to improve physicians' training. WHO is already taking care of this aspect a joint WHO IPA meeting was held in Beijing and a leaflet was jointly produced on air pollution to be circulated widely to paediatricians. The American Academy of Paediatrics produced an environmental health handbook for paediatricians. Nurses are also a key audience especially for prenatal care.

Future plans

The work plan and time table were illustrated as follows:

1. Refine WHO/ECR proposal on CEH indicators based on the comments received during the workshop. Prepare technical descriptions of indicators with support from WHO programmes and external experts; circulate these among participants of the workshop and other relevant people (January-June 2003).
2. Feasibility check of proposed indicators in voluntary Member Countries for availability of data sources, quality of data (August 2003).
3. Revise indicators definitions based on comments received from Member States and others (August-September 2003).
4. Conduct pilot study in representative Member Countries (all sub-regions should be represented) on a few selected indicators (September 2003 – March 2004).
5. Support 2-3 countries in data assessment for core and extended set of indicators (June 2004).
6. Produce report on available data across the European Region for Budapest Conference (June 2004).

Conclusions

Conclusions were drawn jointly by the workshop organizers (David Gee for EEA and Ondine von Ehrenstein and Giorgio Tamburlini for WHO/ECR).

It was felt that the workshop was successful in reaching consensus among participants on a number of critical issues:

1. The suggested approach to indicator development and the proposed framework: there is substantial overlap between the MEME approach proposed by WHO HQ and the Exposure Health Status and Action framework which has been proposed at the meeting by the CHE Unit. The latter represents a simplified version of the DIPSEEA adopted by the WHO/Europe Environmental Indicator proposal, which has been already widely tested in Member States.
2. Indicators should be grouped according to the traditional environmental health exposures and a few modifications for the grouping were proposed (see attached diagram). There was consensus on having specific social environments as a separate risk factor and to include this as an indicator grouping.
3. The emphasis on action indicators was also supported based on the consideration that these can inform policy development and be a powerful advocacy tool. Although they may not be robust from a technical point of view, they allow for standardization of definitions from the outset.
4. While a flexible approach should be proposed with countries free to choose those indicators that best represent their need and data availability, at the same time, a common framework is suggested to promote gradual adoption of the same indicators across MS.
5. Environmental injustice was to be an important issue which should be dealt with by adopting socio-economic indicators as context indicators. There was agreement on the need to make an effort to analyse the distribution of exposure, health outcomes, policy socio-economic groups within and between populations as well as a need for policies that address the needs of the most vulnerable.
6. It was also agreed that the WHO template should be used for the final technical definitions of indicators.
7. It was agreed that the proposed indicator set is a good basis for the development of CEHAPs.

The workshop highlighted a number of issues for further discussion and action:

1. Indicators should also describe emerging issues such as increased chemical emissions, potential hazards for reproduction and development. Although these may not be felt as priorities due to lack of data, these emerging threats should have corresponding indicators.
2. Further efforts should be put in identifying economic indicators to describe the cost of inaction as well as potential savings from preventive action. The workshop participants welcomed the effort of OECD in this area.
3. Indicators of public perception of risk should also be looked at as an area for future development.
4. Bio-monitoring is a still neglected area. Issues of technical methods, epidemiological sampling, and ethical issues regarding risk communication should be discussed further, possibly in a future meeting. EEA declared its interest in organizing such a meeting. It was suggested that European-wide surveys based on a few key biomarkers should be planned for the future.
5. Communication strategies should also be discussed. Communication is the basis for effective participation, including parents, professionals dealing with children, and young people themselves. UNEP expressed the interest to provide technical support in this area. A specific meeting could be devoted to this issue.
6. CEH Indicators should be part of a broader system of child health indicators and WHO and the EU are invited to coordinate their efforts to develop and adopt a common set of indicators. The participants welcomed the effort made by the EC CHILD project to propose indicators based on a broad view of child health with an emphasis on risk, protective factors, and on policy indicators.

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Annex 1

PARTICIPANTS

NATIONAL EXPERTS

Ms Martha Berger
US EPA, Office of Children's Health Protection, USA
<http://www.epa.gov/kids/>

Dr Risa B. Smith
Manager, National Indicators and Assessment Office, Knowledge Integration Directorate, Environment
Canada - <http://www.ec.gc.ca/>

Mr Ed Chu
US EPA, Office of Children's Health Protection, USA
<http://www.epa.gov/kids/>

Asa Ahlgren
The National Board of Health and Welfare, Sweden
<http://www.sos.se>

Dr Marco Hüttenmoser
Dokumentationsstelle Kind und Umwelt, Switzerland
<http://www.mmizuerich.ch>

Dr Peter Rudnai
Deputy Director, National Institute of Environmental Health, Jozsef Fodor National Center of Public
Health, Hungary - <http://www.fjokk.hu/>

Dr Kubinova Ruzena
Director, System of Monitoring the Environ. Impact on Population Health, Czech Republic
<http://www.szu.cz>

Dr Afrim Tabaku
Public Health Institute, Albania

Dr Tracey Woodruff
US EPA, Public Health and Environ. Policy Team, National Center for Environmental Economics, USA
<http://www.epa.gov/kids/>

ADVISORS

Professor Philippe Grandjean
Institute of Community Health, Odense University, Denmark
<http://www.sdu.dk/indexE.html>

Dr C. Vyvyan Howard
FRCPath., Developmental Toxicology-Pathology Group, Department of Human Anatomy and Cell Biology,
UK - <http://www.liverpool.ac.uk>

Michael Rigby
Senior Lecturer, Centre for Health Planning and Management, Keele University, UK
<http://www.keele.ac.uk>

Professor Benedetto Terracini, Italy

Dr Mitch E. Blair
EC CHILD project, Dept. of Paediatrics Obstetrics and Gynaecology, Imperial College School of
Medicine Technology and Medicine, UK - <http://www.ic.ac.uk>

Dr Aidan Mc Farlane
European Society for Social Pediatrics, UK
<http://www.essop.org>

Ms H el ene Therre
Scientific journalist, Denmark

NGOs

Dr Lilian Corra
Vice-President and responsible for America Latina, International Society of Doctors for the Environment (ISDE), Argentina - <http://www.isde.org/>

Ms Marie Louise Bistrup
Network coordinator, International Network for Children's Health, Environment and Safety (INCHES), Denmark - <http://www.inchesnetwork.org/join.html>

Ms Karen Hopfl-Harris
Legislative Director/Staff Attorney, Environment & Health Program, Physicians for Social Responsibility, USA - <http://www.psr.org/home.cfm?id=home>

Dr Peter van den Hazel
Environmental Health Physician, Public Health Services Gelderland Middenq, The Netherlands

Ms Joanne Vincenten
Director, European Child Safety Alliance, European Consumer Safety Association, The Netherlands
<http://www.ecosa.org>

Ms Miriam Levitt
Vice- President of Research, Policy and Programs, Canadian Institute of Child Health, Canada
<http://www.cich.ca>

EEA

Dr David Stanners
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Dr David Gee
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Mr Ronan Uhel
Coordinator for International Cooperation, The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Mr Peter Bosch
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Mr Roel van Aalst
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

UNITED NATION AGENCIES

Dr Eva Steliarova-Foucher (formerly Kramarova)
Unit of Descriptive Epidemiology International Agency for Research on Cancer, IARC, France
<http://www.iarc.fr/>

Dr Kathrine I. Johnsen
Acting Polar Programme Manager, UNEP/GRID-Arendal, Norway
<http://www.grida.no>

Dr Carlos Corvalan
Protection of the Human Environment, Sustainable Development and Healthy Environments, WHO HQ
<http://www.who.int>

Dr Dafina Dalbokova
Air Quality and Health (AIQ), WHO ECEH, Bonn Office, WHO/Europe
<http://www.euro.who.int/EHindicators>

Dr Marco Martuzzi
HMS Unit, WHO ECEH, Rome Office, WHO/Europe
<http://www.euro.who.int/healthimpact>

Ms Leda Nemer
Child and Adolescent Health and Development, Family and Community Health Protection of the Human Environment, WHO HQ - <http://www.euro.who.int/childhealthenv>

Dr Mikael Ostergren
CHD, World Health Organization, Regional Office for Europe, Denmark
<http://www.euro.who.int>

Mr Remigijus Prokhorskas
IDB dept, World Health Organization, Regional Office for Europe, Denmark
<http://www.euro.who.int>

Dr Eva Rehfuss
Occupational and Environmental Health, Protection of the Human Environment, WHO HQ
<http://www.who.int>

Dr Giorgio Tamburlini
Children's Health and Environment Unit, WHO ECEH, Rome Office, WHO/Europe
<http://www.euro.who.int/childhealthenv> and Istituto per l'Infanzia IRCCS Burlo Garofolo, Trieste, Italia

Dr Ondine von Ehrenstein
Children's Health and Environment Unit, WHO ECEH, Rome Office, WHO/Europe
<http://www.euro.who.int/childhealth>

CONFERENCE SECRETARIAT

Ms Eva D. Carlson
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Ms Isabel Fontecha
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Ms Manuela Gallitto
Assistant, Children's Health and Environment Unit, WHO ECEH, Rome Office, WHO/Europe
<http://www.euro.who.int/childhealthenv>

Ms Ulrike Hoffmann
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Ms Charlotte Islev
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Ms Svetlana Maenchen
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Ms Kikki Palmberg
The European Environment Agency, Denmark
<http://www.eea.eu.int/>

Annex 2

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