Doctors for the Environment Australia

Draft document for Children's Environmental Health

Summary

Most Australian children today benefit from better food, cleaner water, more preventive health measures (such as vaccination) and a higher standard of living than ever before. Childhood mortality is very low and many would think that Australian children have never had it so good.

Nevertheless, DEA has serious concerns about the health and welfare of our children. Despite strong scientific evidence these concerns are being ignored. Australia does not have a system for dealing specifically with children's environmental health. There is no expert committee to monitor environmental and other policies that are being put in place and make sure that such policies are appropriate for children. There is no mechanism to identify environmental hazards that children are exposed to in Australia and help develop policies to protect them. Environmental threats in indigenous communities are particularly dangerous and concerning.

In particular, we wish to emphasise the dangers of environmental pollutants. Children are routinely exposed to a number of hidden hazards from pollutants in air, water, food, soil and surfaces, and from consumer products. Children, from conception to adolescence, are particularly vulnerable to environmental pollutants because of their immature metabolism, greater exposure to pollutants relative to their body weight, and longer time to develop chronic diseases that take several decades to appear. Moreover, children have unique exposure patterns due to the particular environments in which they live, learn and play; these are ones over which they have no direct control. Environmental pollutants of concern in Australia include priority air toxics. persistent bioaccumulative toxins that are found in blood, fats and urine, and pesticides.

Doctors for the Environment Australia believes that these hazards should not be considered in isolation. They must be seen it the context of **societal changes** which are increasingly threatening to children's health and wellbeing. And they must be seen in the context of **global environment** where children are vulnerable to the adverse health effects of global warming, (see ISDE policy at www.dea.org.au), environmental degradation and to the effects of social turmoil and war.

Societal Changes The societal changes of the past 50 years are creating a crisis in children's health; The human body and mind cannot evolve quickly enough to cope with these rapid changes. Breakdown of families and communities, longer working hours for both parents and the drive for materialism is causing enormous psychosocial problems in our children. Depression, attention deficit hyperactivity disorder, child abuse, extreme anxiety, behavioural problems, and drug and alcohol abuse are increasingly prevalent. Fast food diets and changes in how children play are leading to unprecedented rates of obesity and diabetes. These problems are all likely to increase if we loose our natural world and continue a hedonist consumer rush in a competitive society.

Global Environmental Issues. Doctors for the Environment Australia recognises that our planet Earth is in grave danger and our children and grandchildren will face an uncertain future because of global warming and unsustainable consumption of our natural resources. The destruction of our environment is already causing unpredictable weather with droughts and floods that threaten our water supplies. Infectious diseases will spread with global warming and children are very vulnerable to conditions such as malaria and dengue fever. Continuing population growth with no reduction in consumption is a danger even in Australia. (see DEA policy on population at www.dea.org.au). Australia is not immune from the effects of regional or international conflict and it must be recognised that their effects on our children's sense of security and development may be profound

Recommendations

1. Establishment at a national specialist office for children's environmental health.
This would be implemented by legislation (eg Child Environment Protection Bill). This office would establish expert committees to be responsible for

(a) Surveillance of government policies
Recognising the need to apply the precautionary principle to all situations that might impact upon childhood health, the Office and its committees would monitor environment and other policies of governments to ensure that they are appropriate to children's health

(b) Monitoring and standards for chemicals and toxic substances
Governments must improve **chemical monitoring** of the environment and human biomonitoring of toxins such as mercury and other bioaccumulative persistent chemicals (PBTs) (biomonitoring of babies and children can use non intrusive cord-blood, meconium and urine testing). As a priority, **standards for exposure** to environmental contaminants that are protective of children must be established rather than base management decisions on adult tolerance levels

(c)Pollution reduction
Government must phase-out all lead additives in gasoline products; reduce air and water pollution through stricter control measures and adopt effective methods for hazardous waste disposal. National and State/Territory regulatory agencies must carry out an urgent review of current uses and alternatives to priority PBTs in Australia including perflourochemicals, phthalates, organophosphates metabolites and some forms of brominated flame retardants. To bring Australia into line with international best practice, an immediate ban of penta and octaBDE forms of BFRs, with an accompanying phase out of decaPBDE over 2 years in required.

(d) Children in indigenous communities
These children are at special risk in relation to (b) and (c). The Office should initiate methods to identify and prevent hazards in these communities.

(e)Development of an Action Plan to embrace the above recommendations
This action plan would be based on the Children's Environment and Health Action plan for Europe

2 Early intervention and prevention.
A new approach is needed for relating to and bringing up children to provide a safe, loving and caring environment. Traditional health services have focused on treating physical ailments and doctors have not been encouraged to manage the mental and emotional aspects. While doctors should promote a change in society with a focus on the need for time and relationships rather than money and consumer goods, governments should improve education about diet and recreational activities and further promote healthy lifestyles. There is need for better coordination and financing of services that can help families and support parents. Early intervention and prevention is essential.

3 National and International Research and Education into Childhood Health
Government must support the development of initiatives in childhood health research, education and information availability in all countries

4.Global and national environmental action.
Governments must greatly increase their endeavours to arrest environmental destruction. Thereby improving the living environment for all children Urgent government action is needed on climate change –The Koyoto Agreement should be signed and Australia should offer leadership in developing stricter agreements involving all nations to reduce green house emissions We must initiate as a priority further action to protect remaining forests, while financially supporting third world countries to do the same; saving our water ways and significantly improve use of non

polluting alternative energy. Australia must continue increase its security and assistance role in the region in order to protect the future wellbeing of our children

A New Approach to Children's Environmental Health:

"Our top priority in health and development must be investing in the future – in children and the young – a group that is particularly vulnerable to environmental hazards.
"

Dr Gro Harlem Brundtland, WHO Director-General, Johannesburg 2002

Background

Definition of Children's Environmental Health:

Environmental health comprises those aspects of a child's life that are determined by interactions with physical, chemical, biological and social factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that may adversely affect the health of present and future generations.

A Threatening Environment for Children:

The risks to children in their everyday environments are numerous. UN system agencies—including WHO—have identified six groups of risks (the big six) that must be tackled as a priority. These are: household water insecurity, lack of hygiene and poor sanitation, air pollution, vector-borne diseases, chemical hazards, and unintentional injuries. These cause the bulk of environmentally-related deaths and disease among children and undermine development. These factors may contribute to over 5 million deaths each year among children. They are further under-----

Globally, inadequate fresh or clean water supplies, contaminants and pollutants in the ambient air, exposures to hazardous and unsafe products and poor waste disposal practices are the major causal factors in determining the impact of environment on children's health. As these environmental factors increase, a growing body of scientific and medical evidence suggests that they are linked to many premature deaths and illnesses in children.

Experts now believe that the single largest cause of death for children globally—estimated to be nearly 5 million a year—is from acute respiratory diseases that arise from or are exacerbated by constant exposures to highly polluted indoor and outdoor air (airborne particulates, sulfur dioxide, ozone). In addition, more than 2 million children die each year from waterborne diseases caused by ingesting bacterially contaminated water. In Europe these numbers are lower, but still staggering.

Exposure may not cause a clinincal illness or death but lead to damage of the developing nervous system. Nearly one in every six, or about 12 million, children in the United States suffers from at least one developmental, learning or behavioral disability such as mental retardation, birth defects, autism or attention deficit hyperactivity disorder. The economic and social burden of these conditions is enormous for developed countries. It is likely that environmental pollutants are a factor in these disorders. This needs extensive research but the precautionary principle cannot be ignored and we need have intesive regulation for toxic chemicals.

Why are children more vulnerable than adults?

Children's body size and unique physical characteristics make them generally more vulnerable than adults to many environmental health hazards. Because their nervous, respiratory, reproductive, and immune systems are in the process of developing, children are in a dynamic, sensitive state of growth that lasts from the time in the womb through adolescence. This makes them more sensitive to environmental health hazards. In addition, their behaviors—the way they interact with their

surroundings— can also put them at greater risk. Typical childhood behaviors such as eating exclusively one kind of food, crawling, digging in dirt, and putting objects in the mouth, can all lead to increased exposures to environmental contaminants.

(a) A child's first environment is the mother's womb. Many chemicals can cross the placenta and permanently damage the fetus. Damaging substances include lead, PCBs, methylmercury, dioxin and nicotine from environmental tobacco smoke.

(b) On a body-weight basis, young children drink more water, eat more food, and breathe more air than adults. The average infant's daily consumption of formula or breast milk per kilogram of body weight is equivalent to an adult male drinking 50 eight-ounce glasses of milk a day

(c) .Children spend more time outdoors than do most adults, often engaged in vigorous play. With their respiratory systems still developing, they can suffer greater exposure to and adverse impacts from air particulates and ozone. Young children also spend many hours close to the ground where they may be exposed to toxicants in dust, soil, and low-lying vapors such as radon or pesticides.

(d) Children have a longer "shelf life." The earlier in life they are exposed to environmental hazards, the more time they have to develop environmentally triggered diseases such as cancer, Parkinson's disease and other chronic illnesses.

The big six environmental health risks to children's health

In this section we will enlarge on the risks listed above ion *A threatening environment for children* and provide commentary as to their relevance to Australian children

1. *Air Pollution*

Exposure to unclean air has emerged as one of the most serious threats to a child's health. Respiratory diseases such as bronchitis, asthma and other chronic lung diseases are growing public health problems for children in many regions of the world. These diseases persist throughout life, affecting health, productivity and welfare. Air pollutants such as particulate matter, ozone, sulfur dioxide and oxides of nitrogen aggravate these diseases. Indoor air pollution is a major causal factor for acute respiratory infections (ARI) deaths in rural and urban areas of developing countries and passive smoking remains a major issue for Australian children.

Asthma is the leading chronic disease among children in Australia. In addition atmospheric pollution increases the morbidity and mortality from ARI and worldwide around 2 million children under the age of five die from ARIs that are aggravated by environmental hazards.

Recent research[1] has confirmed reported associations of childhood cancers with air pollution particularly industrial combustion, volatile organic compounds (VOCs), engine exhausts and specifically 1,3-butadiene, dioxins, and benz(a)pyrene. Exposure may be direct or indirect through placental transfer during foetus development.

2. *Water Pollution*

Microbial contaminants in water can lead to diarrhea, malnutrition and sometimes death. Waterborne diseases are the second single largest category of communicable diseases, after acute respiratory diseases, contributing to infant mortality worldwide. Two million children die from dehydration each year because of diarrheal diseases and the problem becomes most acute for

[1] Knox, E G, Childhood cancers and atmospheric carcinogens, *Journal of Epidemiology and Community Health* 2005;59:101-105

children without access to clean water supplies. Around the world, both biological disease agents and chemical pollutants are compromising the quality of drinking water. Water contamination may spread diseases such as hepatitis B, dysentery , cholera and typhoid fever. High levels of arsenic, lead or fluoride may lead to both acute and chronic diseases in children.

In Australia some indigenous communities do not have access to clean water supplies and these issues are a reality. Melborne has the best quality water in the world because of the isolated catchments- but what about the rest of Australia – crypto infections recently in Sydney – taste and colour poor in Adelaide. There are also broader issues of water supply in the future with increased risks of droughts and flooding. Salinity is also an issue and within 20 years Adelaide's drinking water will fail World Health Organisation salinity standards in 2 days out of 5. (National Action Plan for salinity and water quality)

3. *Hygiene and sanitation*

Globally, 2.4 billion people, most of them living in peri-urban or rural areas in developing countries, do not have access to any type of improved sanitation facilities. Coverage estimates for 1990-2000 show that little progress was made during this period in improving coverage. The lowest levels of service coverage are found in Asia and Africa where 31% and 48 % of the rural populations, respectively, are not served with these services. Examples of sanitation-related diseases include cholera, typhoid, schistosomiasis, and trachoma—today about 6 million people are visually impaired by this disease that causes irreversible blindness. Many indigenous communities in Australia have poor hygiene and sanitation.

4. *Chemical Hazards*

As a result of the increased production and use of chemicals, many chemical hazards are nowadays present in a child's home, school, playground and community. Chemical pollutants are released into the environment by uncontrolled industries, through leakage from toxic wastes sites, from domestic products such as computers, toys and household cleaners. About 50,000 children die every year as a result of poisoning, and a large number are exposed accidentally. Pesticides, cleaners, kerosene, solvents, pharmaceuticals and other products unsafely stored or used at home are the most common causes of acute toxic exposures. Some result in life-threatening poisoning.

Chronic exposure to various pollutants in the environment is linked to damage to the nervous and immune systems and to effects on reproductive function and development. Children are very vulnerable to the neurotoxic effects of lead in paint and air. In many developing countries, the largest source of childhood lead exposure is from leaded gasoline used in motor vehicles, which accounts for up to 90% of airborne lead contamination in many urban areas. High levels of lead exposure can cause severe brain damage or death, while low levels of exposure in early childhood can cause loss of cognitive and motor skills, behavioral disorders, reduced attention span and hyperactivity, and significant lowering of IQ and academic performance. They are also vulnerable to the developmental effects of mercury released into the environment or present as a food contaminant.

Metals such as mercury, arsenic and asbestos, solvents and pesticides are increasingly linked to cancers and other diseases. Moreover, POPs are some of the world's most dangerous chemicals and include highly toxic dioxins, PCBs and pesticides such as DDT. POPs persist in the environment and in the tissues of living organisms. Many people now carry enough POPs in their body fat to cause serious health problems, including reproductive and developmental damage, cancer and immune system disruption. Children carry a myriad of persistent bioaccumulative toxins (PBTs) measured in their blood, fats and urine. While, there has been limited testing of children and babies in Australian, these have demonstrated POPs residues including PCBs, dioxins, organochlorine pesticides as well as the metabolites of organophosphate pesticides and volatile

organic compounds. In US, the most widely used plasticizer, a phthalate are detected in women and children at levels where health impacts are expected.[i]

The WHO and UN have identified possible links of long term exposure to children from certain pesticides including abnormal growth and development, endocrine/hormone disruption, impaired development of the nervous system, cancers, and compromised immune system. [ii] Meconium testing of Australian newborns have demonstrated pestricide contamination with in use pesticides.[2]

Safe levels for exposure to many chemicals are not clear and levels that are recommended for adults may not be safe for children.

There is no room for complacency in Australia. Recent reports issued by the National Academy of Sciences indicate a growing consensus among leading American scientists that neurological and developmental toxins are responsible for a wide range of physical and mental problems among children in the USA. Every year, U.S. industry releases about 24 billion pounds of toxic substances that are believed to cause developmental and neurological problems in children. Electric utilities, chemical manufacturers and the makers of paper, metal and plastics are the largest emitters of neurological and developmental toxins nation-wide. Yet there are no emissions standards for these harmful chemicals in the USA and we know very little about the affect of these chemicals.

Nearly one in every six, or about 12 million, children in the United States suffers from at least one developmental, learning or behavioural disability such as mental retardation, birth defects, autism or attention deficit hyperactivity disorder. These disorders are also very common in Australia and the incidence is increasing. Recent research has suggested that children with autism may have a genetic defect in heavy metals transportation and be more susceptible to environmental pollutants than other children. Evidence for cause and effect is tenuous at present but the implications for child development are too serious for Australians not to be concerned

In Melbourne, 2003, two inner city kindergartens were closed because of high levels of lead and polyaromatic hydrocarbons in the soil and sand pits. They were reopened after a few days but what levels of chemicals are children actually being exposed to in their many varied environments and are we sure these levels are safe? In utero exposure is a particular concern and when we remember that the eggs from which we are born are present in our mother as a foetus in our grandmother, there is a long period for damage to occur

Governments need to address these issues immediately and ensure that the precuationary principle is fully implemented. The consequences of ignoring these threats to childrens health has grave implications for many generations to come.

Further reading:
Polluting Our Future: Chemical Emissions in the U.S. that Affect Child Development and Learning :http://environet.policy.net/health/neighborhood/cehfuture/contents.vtml, A joint initiative of National Environmental Trust (www.environet.policy.net) Physicians for Social Responsibility (www.psr.org) and the Learning Disabilities Association. (www.ldanatl.org)

National Toxics Network ‘Children’s Environmental Health - Intergenerational Equity in Action (2004) (www.oztoxics.org/ntn)

5. *Disease vectors*

There are a number of vector-borne diseases that affect children’s health. Their impact varies in severity. At present 45% of the worlds population are exposed to malaria and 270 million persons

[2] Deuble L, Whitehall JF, Bolisetty S, Patole SK, Ostrea EM* and Whitehall JS.Department of Neonatology, Kirwan Hospital for Women, Townsville. *Deparment of Pediatrics, Wayne State University, Michigan. “Environmental Pollutants In Meconium In Townsville, Australia.” 2000

are infected. Two million die each year mostly children under 5 years old. Environmental models show that in the next century because of global warming 60% of the world's population will be exposed to malaria and areas of Australia will be affected.. *Schistosomiasis* is a water-borne disease that affects children and adolescents mainly, and is related to lack of hygiene and swimming in contaminated water. It is endemic in 74 developing countries. *Japanese encephalitis* occurs only in South and South-east Asia, where it is linked with irrigated rice production ecosystems. Some 90% of cases are children in rural areas, and one in five of these children dies. Annual mortality due to *Dengue* is estimated at around 13 000; more than 80% of these deaths occur in children.

With global warming, there will be an increase in human, animal and plant diseases promoted by ecological disturbance..

6. *Unintentional Injuries or "accidents"*

In 2000, an estimated 685 000 children under the age of 15 were killed by an unintentional injury or "accident". Approximately 20% of all unintentional injury deaths world-wide occur in children under 15 years old and unintentional injuries are among the 10 leading causes of death for this age group. World-wide, the leading causes of unintentional injury death among children are road traffic injuries and drowning, accounting for 21% and 19% of all deaths for this age group, respectively. Although unintentional injuries among children are a global problem, children and adolescents in certain regions of the world are disproportionately affected by injuries. It is estimated that 98% of all childhood unintentional injuries occur in low- and middle-income countries. Children in the African, South-east Asian and Western Pacific regions account for 80% of all childhood unintentional injury deaths.

Australian participation inGlobal initiatives

In Johannesburg in September 2002 The Healthy Environments for Children Alliance (HECA) was established at the World Summit for Sustainable Development.
Australia needs a Children health policy so that it can participate and contribute to this vital component of world health. Conversely we will benefit from the experience of other countries

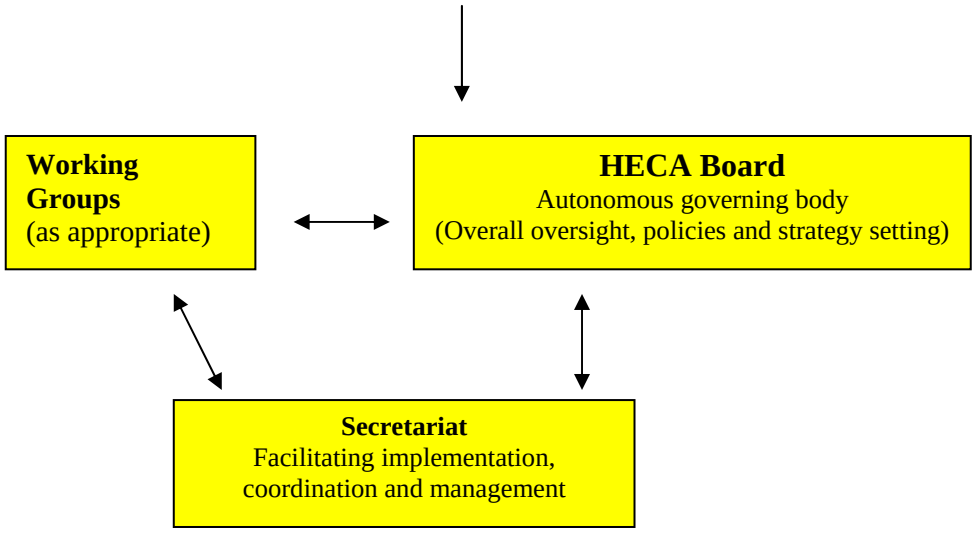
The HECA plan is to mobilise a range of groups within government, civil society and non-governmental organizations, research institutions, academia, and professional associations, UN organisations, development agencies, banks and foundations, private entities and the media, to act together and help make a difference to the lives of children in their local communities. The overarching goal for this movement would be to tackle the environmental risks to children's health in the places where they live, grow, learn and play. By working together effectively, this broad range of actors will be able to generate the momentum needed for a profound impact.

Proposed objectives for the alliance are as follows:

- Ensuring effective advocacy and awareness raising to create healthy environments for children.
- Providing knowledge, information exchange and expertise for effective policies and action.
- Supporting communities in creating and maintaining healthy environments for children.
- Monitoring and evaluating progress.Proposed structuring of the alliance:

Structure of the Alliance

Healthy Environments for Children Alliance Forum
(Large meeting of alliance members every two years)



In Europe, the Children's Environment and Health Action Plan for Europe (CEHAPE) aims to ensure that countries put children's environmental health at the top of the political agenda, for the sake of today's children and future generations.
Australia has no such action plan and needs to adapt the CEHAPE to meet Australian needs and objectives.

The CEHAPE proposes specific actions to address the main environmental risk factors that children are exposed to in their daily lives.

For each of the actions proposed, the CEHAPE:

1. specifies the main objectives to be attained – reduction and/or elimination of children's exposure to environmental risk factors;
2. highlights the settings in which action should be taken; and
3. indicates the sectors that should be responsible for taking action.

See **Appendix** for further details

National action plans on children's environment and health are expected to be integrated into ongoing efforts, either as a separate endeavour or as a complement to an existing process. See appendix three.

Summary of Actions Needed in Australia

In this section we summarise recommendations that emerge from the above discussions

Governments should ask scientists and policy-analysts to operationalise the **precautionary principle** based on children's special susceptibility to environmental factors. Politicians use lack of scientific proof to justify lack of action. But in ecological matters prediction is important and proof is too late to provide a cure. Our survival is now highly dependent on this precautionary principle. This indicates that we take action on the possible outcomes rather than waiting for proof.

Governments should commit to mobilising the necessary resources for increased basic, applied and epidemiological **research** in relation to children's environmental health. To ensure access by all countries to data and information, and to facilitate technology transfer, a global mechanism, such as an intergovernmental panel of scientific experts, should be established to collect and analyse linkages between the environment and children's health, development, and disease. An interactive

exchange among health, environmental, and children's rights experts and organisations could result in greater understanding of these linkages and in more coherent program development.

There is an urgent need for broader **education**, awareness and training to address environmental problems that exacerbate a child's risk of contracting disease. Agencies should provide increased support to local and national governments in developing countries, and to NGO's, to educate and train community leaders, health care staff, and policy makers to develop child protective standards for water, food, housing, hygiene and sanitation.

Governments and international development assistance agencies should establish comprehensive **Environmental Impact Assessment** (EIA) guidelines that recognize the special vulnerability of children, and support field staff in assessing the impacts of projects on children's environmental health, mitigating negative impacts and maximizing potential gains.

Governments should establish **standards for exposure** to environmental contaminants that are protective of children rather than base standards on adult tolerance levels. This includes working to phase-out all lead additives in gasoline products, reduce air and water pollution with stricter control measures and develop effective methods for hazardous waste disposal.

Governments should be **reducing and/or elimination children's exposure to environmental risk factors.** This should include the establishment of a national specialist office for children's environmental health supported by legislation (eg Child Environment Protection Bill) – Governments should improve chemical monitoring of the environment and biomonitoring of toxins in women and children such as mercury and other bioaccumulative persistent chemicals (PBTs) (biomonitoring of babies and children can use non intrusive cord-blood, meconium and urine testing). Governments should carry out an urgent review of current uses and alternatives to priority PBTs in Australia.

Australia does not have a system for dealing specifically with children's environmental health. There is no expert committee to monitor environmental policies that are being put in place and make sure that such policies are appropriate for children. There is no mechanism to identify environmental hazards that children are exposed to in Australia and help develop policies to protect them. Environmental issues in indigenous communities are particularly dangerous and concerning. These issues should be addressed with urgency

Appendix

Framework of actions from CEHAPE

[1] Code
L – Pass and enforce legislation

E – Promote educational programmes and health promotion

P – Promote active involvement of children, care givers, professionals involved in child care and education

M – Increase knowledge by promoting monitoring of environmental exposures, including research

S – Improve service delivery and infrastructure

Environmental risk factor	Main objective	Setting	Code[3]	Specific actions
Indoor air pollution (IAP) IAP in car cabins? (Way to school etc)	Reduce exposure to IAP for children and pregnant women	Home, school, public recreation places	S M	Develop programmes to make safer heating and cooking devices available to households Include questions related to IAP in household surveys

	No renovation of home when women is pregnant (if possible) Reduce exposure to ETS		E L	Educate care givers on ways to reduce exposure of children to IAP (from ETS, cooking, heating devices) Ban smoking in public places
Outdoor air pollution (OAP)	Reduce exposure to OAP	Home, school, public recreation places, industry, way to school (transport sector)	L E P M	Enact measures to control industrial emissions and traffic, to keep air pollution under safety thresholds (PM10 – particulate matter with a diameter of less than ten micrometers – <40µg/m^3) ? peak values? Daily mean? 40 µg is no safety threshold! Effects even below that value. But it is a reasonable goal as a maximum daily mean value! Raise awareness of schoolteachers, parents and children about the hazards of OAP Involve children, schools and communities in advocating for clean air policies Monitor OAP (PM10, PM2,5 and other pollutants!)
Poor water supply and inadequate sanitation	Improve access to basic sanitation	School, public recreation places	L	Enact/enforce legislation to ensure that all buildings where children spend time have access to safe water and basic sanitation infrastructure
	Improve access to sufficient quantities of safe water		E	Provide education to care givers, school administrators, teachers and children on hygienic practices

Environmental risk factor	Main objective	Setting	Code	Specific actions
Poor water supply and inadequate sanitation (Continued)	Improve access to good quality water (Continued)		P	Ensure the setting of child-specific targets is included in national measures to implement the Water and Health Protocol
			M	Monitor water quality to identify specific locations where young children are exposed to unsafe water
Free access to information on water quality data. In our country (Austria) there is the right to obtain all environmental data but drinking water is not considered an environmental medium but a product. So the distributor has to control the water quality but the consumer has no right to know! Lead in old pipes in houses: inform mothers and pregnant women, give them cheap and easy access to lab analyses of their own (stagnant) tap water. (Was provided in Vienna for several years successfully!)				
Inadequate dietary intake	Improve dietary intake	Home, school, antenatal clinics	E	Provide education on optimum dietary intake to care givers, health professionals, schoolteachers and children
			S	Promote nutrition programmes that ensure an optimum food supply that is low in fat, sugar and salt and high in fruits and vegetables
			S	Ensure that universal salt iodization (USI) is in place, to eliminate iodine deficiency, and fortification of flour with iron and folate when appropriate
			M	Monitor child height and weight using international standards, including body mass index (BMI)
			E/P	Involve children and adolescents actively in learning how food is grown, harvested and preserved and about food hygiene, cooking and healthy eating
Food contamination Special attention on food for children & babies, special limit values!	Improve infant and child food safety		M	Develop programmes that control microbiological and chemical contamination of foods, with safety thresholds for children
			L/M	Develop exposure assessment methodology for children
			L	Enact/enforce legislation to ensure appropriate labelling of all foods, especially infant foods and those commonly consumed by children

Environmental risk factor	Main objective	Setting	Code	Specific actions
Inadequate building standards and materials	Ensure a safe environment within the home, school and public places	Home, school and public recreation places	S/L	Ensure housing meets basic infrastructure requirements (for cold, heat and humidity)
			S/L	Ensure that building materials and building sites are free of lead, asbestos and radon building sites free of radon are impossible! Only reduction of exposure is possible!
	Reduce accidents	L safety devices and minimal standards on electric installations	E	Provide education to care givers and children on the prevention of home accidents
Hazardous chemicals	Protect people in the reproductive period, childhood and adolescence from exposure to hazardous chemicals	Home, school and public recreation places	L	Enact legislation on the content of lead in petrol and building material to protect children from exposure to lead
			M	Carry out biomonitoring of lead and polychlorinated biphenyls (PCBs) in at-risk infants pesticides residues? Etc…
			M	Monitor reproductive health indicators, including birth weight, congenital malformations and time to pregnancy (TTP), to detect potential hazards to reproductive health
			M	Monitor the main chemical contaminants of water such as arsenic, nitrates and lead
			L	Enact/enforce legislation to protect children from exposure to hazardous chemicals in toys, furniture and other consumer products
Radiation and electromagnetic fields (EMF) Very little is said here about ionising radiation! There are other sources than radon (see above under building standards) and diagnostic radiation!	Reduce exposure to radiation and EMF	Home, school and public recreation places, hospitals, … (diagnostic radiation)	L	Enact/enforce legislation on safety thresholds, to protect women of reproductive age and children from exposure to diagnostic radiation
	Mobile phones designed for the use of children: especially low SAR levels and declaration on possible risks / maximum exposure		L	Apply prudent avoidance policies, to avoid exposure to EMF
Ultraviolet (UV) radiation	Reduce exposure to UV	Outdoors	E	Educate children, care givers and teachers to raise awareness of the hazards of UV exposure and the need for prevention

Environmental risk factor	Main objective	Setting	Code	Specific actions
Noise	Reduce exposure to noise in schools and residential areas Set limit values for loud toys, walkman, … These items do not fit: noise injuries… Reduce injuries from extremely loud noise Are children really more sensitive than adults to noise?…	Home, school and public recreation places … recreation places… Public recreation places and workplaces Not in general, but as with grown-ups there are sensitive groups …	M E S L L and sensitive tasks.	Monitor noise and exposure to noise Raise awareness of the hazards related to noise among school administrators, teacher and adolescents, parents Reduce exposure to noise by proper insulation of buildings where children spend their time … urban planning Include noise protection for children in urban planning measures – how? Enforce noise limits in specific settings where children spend their time
Mobility and transport	Increase road safety Promote safe mobility and physical activity	Home, school and public recreation places E not only on safety! "eco drive", teach the use of public transport! (read time tables, combine different modes of transport,…)	S/L L E E E P	Create and implement mobility plans to increase road safety and promote safe walking and cycling to school Enact/enforce safety measures such as safe infant transport in cars, helmet use, seat belts, etc. Include driver's education in secondary school curricula Improve physical activity programmes in school curricula Promote physical activity at household and community level Promote children's participation in urban planning (i.e. child-friendly cities)
Environmental emergencies	Develop emergency preparedness	Home, school and public recreation places	E E	Promote emergency preparedness in homes Educate children about emergency preparedness with respect to natural disasters (earthquakes, floods)

Environmental risk factor	Main objective	Setting	Code	Specific actions
Occupational risks	Reduce exposure to hazardous working conditions	Public recreation places and workplaces What have recreation places to do with occupational risks?	L L L/E E E	Ratify ILO Convention 182 concerning the worst forms of child labour Existence of a "Determination of hazardous types of work" in the country Create programmes and enact legislation to eliminate hazardous forms of child labour or remove children from hazardous working conditions Promote awareness among employers of the specific occupational risks to children and adolescents Promote awareness among young working people of their safety rights and the occupational risks present in various forms of work
Specific adverse social environments	Improve child protection policies	Home, school, public recreation places and workplaces	S/L S/L S/L	Promote programmes to reduce child abandonment Promote programmes to encourage alternatives to institutionalization (foster care and adoption) Promote specific programmes to eliminate the phenomena of street children

[i] Second National Report on Human Exposure to Environmental Chemicals (January 2003), Department of Health and Human Services, Centers for Disease Control and Prevention

[ii] UNEP, UNICEF & WHO, Children in the New Millennium: Environmental Impact on Health (2002) *Sources include the United Nations Environment Programme, United Nations Children's Fund, World Health Organization, Food and Agricultural Organization, Childhood Pesticide Poisoning: Information for Advocacy and Action (draft), 2000; and Mott, Lawrie et al., Our Children at Risk: The 5 worst environmental threats to their health. Natural Resource Defense Council, New York, 1997.*