

## **Children's Health and the Environment - Building Capacities of Action**

Concern is growing about the environmental origin of childhood disorders and developmental problems. New knowledge is available about existing and new, emerging physical, chemical and biological environmental risk factors. Much more is known nowadays about the special susceptibility of children - during "critical windows of vulnerability"- and as a result of their special behavior and dynamic physiology that may predispose those to higher exposures. In addition, the environment is changing rapidly, as a result of increased chemical production, transportation and use, deforestation, urbanization patterns, climate change, *etc.*

Recent WHO estimates on the global burden of disease show that 24% of the global disease burden (healthy life years lost) and 23 % of all deaths may be related to environmental causes. In children, environmental influences can account for over 1/3 of the disease burden and 36% of deaths in the 0-14 years old. In developing areas, the impact of adverse environment is higher and children may loose 8-times more healthy life years per capita than children in developed countries. In poorer regions of the world, the disparity is even greater; for example the number of healthy life years lost due to lower respiratory infection is 800 times greater per capita. Mental retardation caused by lead in gasoline is 30 times higher in areas where it is used, compared with areas where it was banned (1).

Indian children are not healthy. To a considerable degree this is because of the deteriorating state of their environment. According to The Ministry of Health and Family Welfare's report, 55 % of child mortality in India is due to conditions originating in the perinatal period. A significant proportion of the rest is strongly related to environmental causes.

Children in India are subjected to double burden

of environmental hazards (2). In India, children have to bear the double burden of diseases that have persisted for generations as well as of new diseases caused by various environmental factors. The constant assaults of both traditional diseases such as diarrhea, malaria and other infectious diseases *etc.*, and modern diseases caused by poisoning and contamination by pesticides and fertilizers in dusts, air, water and food, plastic wastes, agricultural or industrial effluents *etc.*, make children specially vulnerable to a range of infections.

This affects the unborn fetus as well. In urban India, another emerging challenge are the lifestyle-related diseases such as diabetes, attention deficient disorders and obesity that are also on the rise, as urban children are getting addicted to "junk" food with little or no nutritive value and are leading an increasingly sedentary life (3).

The Health Information of India reports show that environmental reasons are increasingly responsible for increased mortality in women and children. According to the report, 55% of child mortality in India is due to conditions originating in the perinatal period. A significant proportion of the other 45%, as shown in the table, are strongly related to environmental causes (3). But this data is only that of recorded deaths.

The World Health Report (1999) of the WHO shows that 429,000 children in India die every year due to childhood diseases (pertussis, polio, diphtheria, measles and tetanus) alone. This estimate is about three times the figure given in the Health Information of India report.

Smith, *et al.*(4) from University of California, Berkley, found that At least 20% of overall mortality in India is attributable to environmental factors. Of this, foul indoor air and dirty water alone cause about 80 per cent of deaths. Another 12-15% are indirectly triggered by environment but the causal link may not evident. *Table I* shows that 18.5% of all disease burdens across all ages in India are caused by environment and its degradation (5).

**TABLE I**—*Environmental Factors in the Burden of Disease Across India -2001*

Access to water and sanitation	9 %
Vector diseases (Malaria)	0.5 %
Indoor air pollution	6. %
Urban air pollution	2 %
Agro industrial pollution	1 %
All environmental factors	18.5 %

Source: Ref 5.

Health is an excellent indicator of degrading environment. Greater the degradation and abuse, greater is the environmental component that contributes to burden of (environment) disease. Therefore environmental diseases can be simply classified as those that are due to, (a) Strong environmental causes *e.g.*, respiratory illnesses, infectious diseases, endocrine disorders, congenital anomalies and injuries and poisonings (b) Moderate environmental causes *e.g.*, neoplasm's, nervous and circulatory system, and (c) Somewhat moderate environmental causes *e.g.*, digestive, genitourinary system, certain blood diseases and ill defined symptoms (4).

Both in industrialized and developing countries, pediatricians may not be fully aware about the impact of unsafe environments on the burden of disease, nor about the measures that they can take for improving children's health through better environments. Health professionals in the "front line", dealing with children and adolescents and interacting with their families and communities are well positioned to recognize, investigate and help prevent environment related diseases. They are in a strategic position to collect data, undertake research, stimulate the action of decision-makers and promote the education of family members, communities and the children themselves(6).

In response to the needs identified in this area, the WHO Department of Public Health and Environment (PHE) promotes a number of activities on Children's Health and Environment, including: (i) awareness-raising at the community level, (ii) training activities for health care providers, (iii) gathering data on the main problems affecting children's health through their environment, (iv) transferring and/or adapting successful

prevention and education 'models' tested in different countries - with special emphasis on "prevention".

A training package for the health sector has been prepared, with peer-reviewed modules that are used for implementing short courses on Children's Environmental Health (CEH), in association with pediatric associations. As evidence grows on the environmental determinants of the fetal origins of adult disease, the importance of improving the surveillance and follow-up of pregnancy and promoting healthier environments for the mothers-to-be and pregnant women is underscored. In order to address this area, a set of training modules on the Fetal/Environmental Origins of Disease is being developed and is expected to be ready by 2008.

A "green page" for the clinical record has been drafted to stimulate the pediatric environmental history taking and the recording of environmental risk factors present in places where the child lives, learns and plays.

A number of partnerships established with scientific associations (paediatricians, nurses) and NGOs ensure the success of these capacity building activities that lay out the basis for collaborative research. In fact, the promotion of collaborative research in children's environmental health among scientists in developing and developed countries is critical to addressing health problems in their national and global contexts. The results of appropriate research studies can be used to implement prevention/intervention and remediation strategies and put in place evidence-based public health policies at the country level. These collaborative activities also result in technology transfer and capacity building, and in the build-up of a network of trained scientific collaborators throughout the developing world(7).

WHO has joined efforts with the International Paediatric Association (IPA) and US Environmental Protection Agency in order to promote training activities among its member societies.

The event recently organized by the Indian Academy of Pediatrics (hosted by the IAP Environment and Child Health Group) in Delhi has mobilized a critical mass of paediatricians with

specific interest in children's environmental health, expanding their horizons in the area, providing tools for capacity building, and triggering an ambitious program that will aim at providing healthier environments for healthier children in India. This was a master trainer program for two days for capacity building and has come out with a Delhi declaration which gives a commitment for working for the environment and child health in India.

*Funding:* Nil.

*Competing interests:* None.

**J. Pronczuk,**

*World Health Organization,*

*Geneva, Switzerland.*

and

**Swati Y. Bhave\*,**

*Chairperson,*

*IAP Environment and Child Health Group,*

*Member, IPA Committee on Environment*

*and Child Health,*

*CII/44, Shahjehan Road, New Delhi 110 003,*

*India.*

*E-mail: sybhave@yahoo.com*

\* Corresponding author

## REFERENCES

1. Preventing Disease Through Healthy Environments - Towards an estimate of the global burden of disease; Prus-Ustun A & Corvalan C, WHO, Geneva, 2006.
2. Lal P, Future was Yesterday, Health and Environment Newsletter, March 2002, available at <http://www.cseindia.org/html/healthnews/children.pdf>, as viewed on March 25, 2007
3. Lal P. Fevers of unknown origins. Down to Earth. New Delhi: Centre for Science and Environment; Nov 15, 2000.
4. Smith KR, Corvalan CF, Kjellstrom T. How much global ill health is attributable to environmental factors? Epidemiology 1999; 10: 573-584.
5. Anon, 2003, Delhi Urban Environment and Infrastructure Improvement Project, Delhi-2021 (DUEIIP), draft report, The Planning Department, Government of National Capital Territory of Delhi, New Delhi, available at <http://delhiplanning.nic.in/Planning.htm> as viewed on March 19, 2007
6. Pronczuk-Garbino J. Children's Health and the Environment: A Global Perspective. Geneva: WHO; 2005.