

- Look for specific exposures and risks, for example, to fluoride or arsenic in drinking water)
- Call for action to minimize these exposures and risks
- Collaborate on data collection and research

Future needs

Pediatricians have started to be more active in environmental health matters. But much more needs to be done:

- Improve pre-doctoral and in-service training of pediatricians on environmental health matters
- Expand the advocacy role of pediatric societies to bolster the political will to invest in water and sanitation at the national and local level.
- Increase knowledge about the relative contribution of water pollution to child morbidity and mortality in different geographical areas and about the potential for risk reduction of interventions, carried out at household as well as community level.

IPA and WHO are committed to respond to some of these needs in collaboration with non-governmental organizations.



Selected references:

American Academy of Pediatrics. Pediatric Environmental Health (2nd Edition). Etzel RA (ed). Elk Grove Village, IL, USA, American Academy of Pediatrics, 2003

Tamburini G, von Ehrenstein OS, Bertollini R (eds). Children's environmental health: review of the evidence. European Environment Agency and WHO Regional Office for Europe, Copenhagen, 2002 (www.who.it/childrenhealth)

Useful addresses & web sites:

International Pediatric Association:
<http://www.ipa-world.org>

World Health Organization, Department of the Protection of the Human Environment
<http://www.who.int/peh>



World Health Organization



international pediatric association
association internationale de pédiatrie
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Water and Sanitation

What a pediatrician needs to know...

Water pollution and inadequate sanitation are major environmental problems affecting all countries of the world. Contaminated water causes many life-threatening diseases including diarrhea, the second biggest child killer in the world. In 2002, diarrhea is estimated to have caused 1.6 million child deaths. Around the world, both biological agents and chemical pollutants are compromising the quality of drinking water. It is therefore necessary that pediatricians and all child health professionals increase their efforts to protect children from the effects of water pollution and inadequate sanitation.

To promote these efforts, IPA and WHO have prepared this material, which is aimed at providing essential information and guidance to pediatricians and other professionals involved in child health.

Sources of water pollution and important compounds

Biological contaminants of water sources include parasites, bacteria and viruses. The most important source of water contamination in developing countries is hu-

man feces, due to the lack of adequate sanitation facilities. Today, about 2.4 billion people do not have access to even a simple latrine.

Chemical contaminants of water sources include nitrates, arsenic and fluoride. Nitrates may enter water from artificial fertilizer runoff and from untreated wastewater discharge. Arsenic and fluoride occur naturally in groundwater in certain parts of the world.

Health hazards to children due to water and sanitation



Children are especially vulnerable to waterborne diseases because they drink more water, per kilogram, than do adults. They also have a higher metabolic rate and greater invisible water losses, making them more vulnerable to dehydration when they have diarrhea. Exposure to polluted water poses a variety of health hazards to children, depending on whether the contaminant is biological or chemical.

Biological contaminants

There are six main diseases associated with inadequate sanitation and biological contaminants in the water supply:

- Diarrhea
- Ascariasis/Trichuriasis
- Ascaris
- Dracunculiasis
- Hookworm
- Schistosomiasis
- Trachoma

Every twenty seconds, a child dies of a water-related disease. At any given time, about half of the people in the developing world have one or more of these diseases.

Chemical contaminants

Nitrate contamination results in methemoglobinemia (“blue baby syndrome”) in infants younger than 4 months. They are at risk because of the presence of fetal hemoglobin and their higher gastric pH. With many chemicals, whilst exposure in childhood determines outcomes, symptoms most frequently develop during adulthood. Arsenic may lead to skin changes (hyperkeratosis) and increases the risk of skin, bladder, and lung cancers. Ingesting too much fluoride in drinking water causes dental and skeletal fluorosis (characterized by knock-knees, bowlegs, and generalized skeletal deformities).

What pediatricians and other child health professionals can do

Pediatricians and child health professionals can play a role in protecting children from the effects of water pollution and should act at the Individual level and community levels.

Individual level

- Consider relevant environmental information in history taking (e.g., child’s source of drinking water)
- Encourage breast feeding
- Promote oral rehydration therapy
- Discourage use of water with elevated nitrate levels for ingestion by infants
- Promote intake of calcium and vitamins A and C to help prevent risks of skeletal fluorosis

Community level:

- Promote sanitary excreta disposal so that feces do not come into contact with water sources, food, or people.
- Engage the community in helping maintain their clean water supply and sanitary installations
- Promote hand washing as a simple and effective way of blocking hand-to-mouth disease transmission
- Test community well water for coliforms, arsenic and fluoride
- Encourage programs to promote gardening and the consumption of fruit and vegetable varieties that are rich in vitamin A.