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## 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 Department of Child and Adolescent Health and Development:  
<http://www.who.int/child-adolescent-health>

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## A JOINT PROJECT

of



WORLD HEALTH ORGANIZATION

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# AIR POLLUTION

## What a paediatrician needs to know...



Follow-up to the  
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# AIR POLLUTION

## What a paediatrician needs to know...



Air pollution, both indoor and outdoor, is a major and growing environmental problem affecting all countries of the world. Air pollution represents in most countries the largest single environment-related cause of ill health among children, and the second largest, after the scarcity of safe water and lack of sanitation, in other countries. It is therefore necessary that paediatricians and all child health professionals increase their efforts to protect children from the short and long-term effects of air pollution.

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

## What we know about air pollution and its effects on children

### Sources of air pollution and important compounds

There are many sources of indoor and outdoor air pollution. Outdoor sources include motor vehicles and industrial sources mostly in the urban and suburban areas of cities in all countries. Indoor sources include environmental tobacco smoke, building construction materials, insulation materials, house dust, mould spores, animal dander, consumer products, furnishings, cleaning agents, infiltration of outdoor air pollution, and, particularly in developing countries, open stoves used for cooking and heating. In developing countries the use of biomass fuels (wood, coal, cow dung, crop residues etc.) is by far the largest source of indoor air pollution both in rural and urban areas.

The most important air pollutants are:

- Particulate matter, which consists of particles of very small sizes, some less than 2.5 microns of diameter
- Gaseous pollutants such as ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>)
- Polycyclic aromatic hydrocarbons (PAHs) such as benzo[a]pyrene
- Volatile organic compounds, such as formaldehyde and benzene
- Heavy metals such as mercury, lead and cadmium
- Biological matter such as mould spores and animal dander



### Health hazards to children due to indoor and outdoor air pollution

Exposure to air pollution poses a variety of health hazards to children, from conception to adolescence. These include:

- Respiratory morbidity such as acute respiratory infections and asthma
- Poor pregnancy outcomes such as low birth weight
- Respiratory mortality
- Developmental disorders
- Cancer
- Other disorders



Air pollutants, for example lead, can also contaminate food and water, and cause adverse health effects through these media.

Globally, the greatest health burden of air pollution on children is represented by the increased risk of acute respiratory infections. It has been estimated that 36% of the more than 2 million deaths in children under five caused by acute lower respiratory infections are attributable to indoor air pollution.

## What paediatricians and other child health professionals can do

Paediatricians and child health professionals can play a role in protecting children from the effects of air pollution at

### The individual level:

- Consider relevant environmental information in history taking, e.g. exposure to smoke from biomass fuels, environmental tobacco smoke, mould spores or animal dander
- Visit and inspect the child's environment
- Provide anticipatory guidance to parents on how to reduce the exposure of their children to air pollutants
- Discuss interventions such as smoking cessation, improved ventilation of the house, proper maintenance of stoves, use of more less-polluting stoves, installation of chimneys and hoods, and keeping children as far away as possible from unavoidable sources of pollution
- Discuss changes in lifestyle and behaviour to reduce exposure to environmental tobacco smoke

To do so effectively, professionals involved in child health should know about the main sources of air pollutants in the households and in the communities they serve, and about the relevant knowledge and practices. They should also become familiar with data that can be locally available from air monitoring systems and compare them with known WHO guidelines and national standards.

### Community level:

- Look for specific exposures and risks, for example, to widespread use of biomass combustion, to the existence of a coal power plant or industrial emissions.
- Call for action to minimize these exposures and risks.
- Be prepared to play a role in health information and education.
- Promote the right-to-know of communities and families about the role of the various contaminants with respect to specific health effects, and information about feasible interventions and their expected results.
- Collaborate with other health professionals and sectors of society.
- Ask for better training in environmental health matters
- Collaborate on data collection and research.
- Take into account groups that are at increased risk due to multiple exposures (for example: biomass fuel burning at home combined with heavy outdoor air contamination in urban slums).



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## Future Needs

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

- Improve pre-doctoral as well as in-service training of paediatricians on environmental health matters.
- Expand the advocacy role of paediatric societies at the national and local level.
- Improve technical guidelines for paediatricians and communication tools for families and teachers, adapted to local needs and cultural features.
- Increase knowledge about the relative contribution of air 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 at community level.

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