

mosquito-borne diseases: use of insecticide-impregnated mosquito nets; fitting of screens to windows, doors and eaves of houses; application of zooprophyllaxis in places where mosquitoes are distinctly zoophilic; use of insect repellents and improvement of water management.

- Promote the community participation to improve housing, obtain sanitation facilities, carry out physical and biological control of vectors-breeding grounds and use insecticides in a rational way when they are really needed.
- Collaborate on data collection and research on VBD in children.

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



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World Health Organization



international pediatric association  
association internationale de pédiatrie  
asociación internacional de pediatría

**Address for correspondence:**  
International Pediatric Association  
17, rue du Cendrier, P.O. Box 1726  
CH-1211 Geneva 1  
Switzerland

## VECTOR-BORNE DISEASES



### What a pediatrician needs to know...

Infectious diseases have been cause for concern to human beings from time immemorial and, among them, Vector-borne Diseases (VBDs) have stood out for their high impact on the inhabitants of different parts of the world. VBDs are caused by parasites and viruses that are transmitted by bloodsucking insects like mosquitoes, sandflies, ticks, fleas, flies, and other.

Some VBDs like malaria and dengue are spread all over the world in tropical and subtropical areas. Others have regional importance since they affect only the inhabitants of certain regions in some continents such as the American Trypanosomiasis (Chagas' Disease), African Trypanosomiasis (Sleeping Sickness), viral diseases transmitted by arthropods (Japanese Encephalitis, Yellow Fever, St. Louis Encephalitis, Venezuelan Equine Encephalitis), Leishmaniasis, Onchocerciasis (River Blindness) and other.

At the end of the twentieth century there was an increase in the incidence of VBDs and once again they had to be considered as an important problem to public health. Although many VBDs have persisted so far in time, the resurgence of others has been due to climatic change, deforestation, and the global increase in poverty and international travels.



New challenges to control VBDs through preventive environmental measures have appeared due to the following facts: the lack of vaccines or effective drugs for some diseases; the development of parasite's resistance to some drugs that had previously been effective and the vectors' resistance to one or more insecticides. These preventive measures are aimed to avoid or to diminish the contact between human beings and vectors.

### Some VBDs stand out because they affect mainly children:

#### ■ Malaria

Malaria is a paradigmatic vector-borne disease caused by *Plasmodium* species and transmitted by female *Anopheles* mosquito. Malaria exists in 100 countries and accounts for more than 1 million deaths annually, mostly in children under five (*World Health Report 2003, WHO*). It is a main impediment to human development in poor countries since it causes enormous economic drains.

#### ■ Dengue and Dengue Hemorrhagic Fever

Dengue fever is a VBD of flaviviral origin. Four serotypes of dengue virus are transmitted in the tropics by the bite of *Aedes aegypti* mosquito. Globally, dengue fever affects an estimated 100 million people and dengue hemorrhagic fever (DHF) 500.000 people over the world per year. Annually, mortality due to dengue fever and DHF is estimated at around 13.000; more than 80% of these deaths occur in children.



Cross-protective immunity among different kinds of serotypes of dengue virus is limited, therefore epidemic transmission recurs with the introduction of novel serotypes. Apparently secondary infections might cause a predisposition towards DHF.

#### ■ Japanese Encephalitis

Japanese encephalitis is a flaviviral infection transmitted by mosquitoes belonging to *Culex tritaeniorhynchus* and *C. vishnui* groups. The mosquito vectors chiefly feed outdoors in the evening and prefer animal to human hosts. Japanese encephalitis is a leading cause of viral encephalitis in South and South-east Asia, where it is linked with irrigated rice production ecosystems. More than 99% of infections are sub-clinical and the annual figure of clinical cases is estimated at about 40.000. Some 90% of these cases are children in rural areas, with a 20% case-fatality rate (WHO).

#### ■ Leishmaniasis

Leishmaniasis refers to the spectrum of diseases caused by the protozoa *Leishmania spp.* The insect vectors of leishmaniasis are the female phlebotomine sandflies. The disease threatens 350 million men, women and children in 88 countries around the world, and it is clinically divided into visceral, mucocutaneous and mucosal syndromes. Leishmaniasis is a cause of economic an social backwardness in those countries which suffer from it.

### What pediatricians and other child health professionals can do

Pediatricians and other child health professionals can play a very important role in protecting children from VBDs and they should be well informed about the vector-borne infectious diseases prevalent in the region in which they live. They should act at individual and community levels:

#### Individual level

- Write a thorough pediatric environmental clinical history, which should include the risks patients are exposed to.
- Visit and inspect children's environment.
- Give parents instructions on how to reduce family members' exposure to vectors, teaching them the best ways to avoid bites and how to detect and destroy or protect indoor and outdoor vector-breeding sites.
- Encourage parents to have their children vaccinated whenever this option were possible.
- Inform parents what to do in case their children show symptoms or signs characteristic of the VBD that prevails in their area.
- Treat those children whose VBD diagnoses were confirmed.

#### Community level

- Be prepared to play a role in health community education and information. Warn the community about the best way of reducing the risks that being in contact with vectors that transmit infectious diseases involve. WHO has proposed a combination of five interventions in different settings to fight