

Dengue aggravation in developing countries in 2007

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According to Singapore's daily *Lianhe Zaobao*, dengue fever (DF) and dengue hemorrhagic fever (DHF) cases in 2007 may have hit a new high and represent a major public health problem.

The DF epidemic is not limited to Singapore, bringing calamity to most developing countries in the tropics. In Malaysia, for instance, 48 people died over the past five months as a result of DF, marking an increase of about 46% over last year. The DF peak has sounded the alarm bell for countries where dengue is endemic, but why is this epidemic conspicuously endemic to these countries? Why it is seldom seen in developed countries like the US, Japan, and nations in Europe? What measures should be taken for effective disease prevention and control in developing countries?

DF (or classic dengue; primary dengue) and DHF (or dengue shock syndrome, DSS; secondary dengue) are acute febrile diseases caused by four closely related virus serotypes of the genus virus, DEN-1, DEN-2, DEN-3, and DEN-4, that are transmitted to humans by the *Aedes aegypti* (and rarely *Aedes albopictus*) mosquito.

Tropical environments provide favorable conditions for mosquitos to breed and thus increase the risk of DF occurring. At the same time, global warming has made mosquitos more active; the geographic areas where they live have extended to both north and south of the equator, thus spreading DF more rapidly. Moreover, unremitting rainfall in the tropics may play an important role in dengue aggravation.

The reasons for the dramatic global emergence of DF/DHF are complex and not well understood; the natural environment is an important and inevitable

factor, but more attention should be paid to several social factors.

First, major global demographic changes have occurred, the most important of which have been uncontrolled urbanization and concurrent population growth, especially in some developing countries. These demographic changes have resulted in substandard housing and inadequate water, sewer, and waste management systems, all of which increase *Aedes aegypti* population densities and facilitate transmission of *Aedes aegypti*-borne disease.

Second, the development of tourism in developing countries provides an ideal mechanism for infected human transport of dengue viruses between population centers in the tropics, resulting in a frequent exchange of dengue viruses and other pathogens.

Last, relatively poor hygiene in developing countries is another significant risk factor for dengue infection. Consequently, effective mosquito control is virtually nonexistent in most dengue-endemic countries. In other words, this epidemic has also exposed fatal flaws in these countries' systems of disease prevention and control.

Given that there is no dengue vaccine currently available, effective measures to control mosquitos are acceptable while awareness of hygiene is better, but the optimal solution to this problem is a sound system for disease prevention and control in accordance conditions in developing countries.

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