



Responding to Dengue Fever

By Ralph Morris, MD, MPH

In the wake of recent monsoons and flooding, mosquito-borne dengue fever is once again on the rise in the Asia Pacific Region. According to the [US Centers for Disease Control and Prevention](#) (CDC), worldwide, dengue fever cases number over 50 million annually. The World Health Organization (WHO) estimates¹ that globally 2.5 billion people, over one-third of the world's population, live in areas that put them at risk for the viral disease, and about 70 percent of them (1.8 billion) live in the Asia Pacific Region.

Dengue is rare in the continental US, but endemic in Puerto Rico, where the CDC maintains a center of expertise and a diagnostic laboratory in its San Juan [Dengue Branch](#). It is also endemic to the Caribbean, Mexico and Central America. According to the [Gates Foundation website](#), dengue fever incidence has increased 30-fold worldwide since the 1960s. Increasing urbanization and global travel contribute to ongoing outbreaks globally.



The female Aedes aegypti mosquito is the “vector” that transmits dengue fever from person to person.

Image reprinted from the US Centers for Disease Control and Prevention [website](#).

Dengue Fever Symptoms

Dengue fever symptoms range from mild fever to incapacitating high fever, with severe headache, pain behind the eyes, muscle and joint pain and rash, according to the [World Health Organization](#). Symptoms appear 3 -14 days after the infective bite. The [CDC advises](#) patients to go immediately to an emergency room or closest health care provider if any of the following warning symptoms appear:

- *Severe abdominal pain or persistent vomiting*
- *Red spots or patches on the skin*
- *Bleeding from nose or gums*
- *Vomiting blood*
- *Black, tarry stools (feces, excrement)*
- *Drowsiness or irritability*
- *Pale, cold, or clammy skin*
- *Difficulty breathing*

Dengue hemorrhagic fever is a severe, potentially lethal form of the disease that generally requires hospitalization. Children usually have a much milder form of dengue fever than adults, but those who survive the disease have a much greater chance of dengue hemorrhagic fever if they are subsequently infected as adults with a different serotype of the virus.

¹See: World Health Organization, Regional Office for South-East Asia, [Asia-Pacific Dengue Strategic Plan \(2008-2015\)](#)

Avoiding Mosquitoes to Avoid Dengue Fever

Dengue fever is spread by the bite of infected *Aedes aegypti* mosquitoes, which are endemic to the southeast sector of the US among other world regions. Humans are the reservoir of the disease, and there are at least four dengue viruses. A person bitten by an infected mosquito may or may not develop symptoms. That person cannot transmit the illness directly to others, but if a mosquito bites that person after he/she becomes infected, that mosquito can spread dengue fever to others through ongoing biting. According to the [CDC](#), the *Aedes aegypti* bites primarily during the day. This species is most active for approximately two hours after sunrise and several hours before sunset, but it can bite at night in well-lit areas.

There is neither a vaccine for dengue fever nor specific antiviral medicines to treat the illness. Preventing dengue is a matter of avoiding mosquitoes and their bites. Strategies include:

- Eliminate standing water in flower pots, buckets, barrels, old tires, untreated kiddie pools and other containers that can serve as breeding grounds for mosquitoes.
- Ensure good drainage of water around homes.
- Maintain a chlorine residual of about 1 mg/l in stored treated drinking water; drinking water storage is common in developing countries that lack central water distribution.
- Make sure backyard pools are appropriately chlorinated as mosquitoes will not breed in chlorinated water.
- Inspect and repair window and door screens.
- Apply an insect repellent to exposed skin and/or clothing when spending time outdoors. Products containing DEET, picaridin, IR3535, and some products containing oil of lemon eucalyptus and para-menthane-diol may provide long-lasting protection; follow label directions for use.²
- Apply insect repellent to skin after applying sunscreen, if sunscreen is to be used.
- When you are outdoors, air movement around your body (from fans or natural breezes) disrupts mosquito flight and reduces your risk of being bitten.

The Indian Government is Activated

The [Indian Express](#) reports the current Dengue Fever outbreak is the worst one in five years, and notes other diseases with similar symptoms are also on the rise, including typhoid and B. coli. The newspaper reports government inspectors go house-to-house in New Delhi in search of standing water, for even a few milliliters of clear water can become the breeding grounds of mosquitoes. Steep fines are imposed on residents who harbor standing water. Fumigation is practiced in some areas. Children are advised to wear full-sleeved shirts.

Government doctors have been told they will be on the job with no leave until the outbreak subsides and the number of hospital beds has been increased.

A High-opportunity Target

As flooding in the Asia Pacific region subsides, dengue cases are expected to decline. Nevertheless, the disease remains one of the “most widespread vector-borne viral infections in the world,” according to the WHO.³ The Gates Foundation calls dengue fever a “high-opportunity target” because several potential vaccines are in

²For more information on insect repellents and their effectiveness, please see <http://cfpub.epa.gov/oppref/insect/>.

³WHO. Dengue hemorrhagic fever: Diagnosis, treatment, prevention and control. Geneva. World Health Organization, (1997): 12-23

development. The foundation supports efforts to develop a dengue vaccine, which it estimates could prevent more than 500,000 hospitalizations and 3,000 deaths annually, most of these among children (see [press release](#)).

An effective vaccine against dengue fever is the response we would most like to see to this global scourge.

For more information on dengue fever and the Aedes aegypti mosquito, please see this [CDC](#) resource.

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