

# Dengue Fever

## **What is dengue fever?**

Dengue fever is a viral infection that is spread to humans by the bite of a specific type of mosquito. There are 100 million cases per year and travellers are at highest risk in Southeast Asian countries and the northern countries of South America. There are four strains.

## **What are the symptoms?**

Symptoms develop 3 to 14 days after being bitten and include sudden high fever, headache, generalized weakness; intense muscle and joint pain ("break bone fever"). Half the people affected have a bright red rash. The disease is usually self limiting and lasts about 6 days. There are rare but dangerous complications with dengue fever that occur more often in people who have previously suffered from a different strain of the disease. These rare complications include hemorrhagic fever and shock and are medical emergencies. In these cases, milder symptoms progress to include persistent high fever, abdominal pain, vomiting, bleeding, circulatory failure, shock, and death. Severe reactions are rare in travellers.

## **Who is at risk?**

Dengue occurs more frequently during warm, humid seasons and is more easily transmitted in the daytime in urban areas. All persons are at risk in this type of environment in endemic countries. Those at most risk for complications are anyone with a history of Dengue Fever. The recurrence of the disease caused by a different strain would be very dangerous.

## **How can I protect myself?**

There is no vaccine for Dengue Fever. Travellers must take measures to prevent insects from biting, being especially vigilant during early morning and late afternoon hours.

## **Chemical insect repellents**

### **DEET**

This is the standard against which other repellents are tested because it has been proven to be the most effective repellent for over 40 years. It is also effective against more species of biting insects than any other repellent. It has no effect against bees and wasps.

### **Toxicity/safety**

The American EPA has concluded, DEET does not present any health concerns if label directions are followed. Preparations of less than 50% DEET are almost free of

side effects when applied to the skin of adults. Even with children, a 1994 study concluded there was no correlation between the severity of side effects and age, gender or concentration of DEET.

### **Safety precautions**

**Despite the confidence of minimal side effects, the EPA recommends:**

- lightly cover only exposed areas of skin,
- avoid mouth, eyes and the palms of children's hands,
- avoid inhalation of aerosol or spray,
- avoid cuts, inflamed or irritated skin,
- wear long sleeves & long pants to decrease amount of exposed skin, and
- shower or wash repellent-treated skin when danger is removed.

### **Concentrations**

Low concentrations of DEET (5% to 10% range) will prevent nuisance bites but do not provide sufficient protection where insect-borne diseases are a real threat. For protection in these areas of risk, 20% to 35% DEET concentration is needed. This provides protection for six to eight hours. You will need to reapply after this time.

### **Use of DEET with children**

Although there is no proven correlation between concentration of DEET and harmful effects on children, more than 35% concentration should NOT be used. Caregivers who select a very low concentration of DEET for children will need to either apply DEET more frequently or implement additional measures of protection such as 'bug suits' or netting. Do not allow children to handle DEET directly and wash the DEET off once safely indoors in a bug free environment.

### **Botanical repellents**

Plant-based insect repellents are derived from a variety of plants with a variety of results.

Only a few have been proven to give anymore than short-lasting protection. The exceptions are soybean oil-based repellents and lemon eucalyptus repellents. These can give between 90 and 120 minutes of protection.

### **Protective clothing**

Wear light-coloured long-sleeved shirts, trousers, socks & shoes and tuck trousers into socks. Hooded 'bug suits' are available for children. Treat clothing with Permethrin, a strong insecticide that kills insects and stays in treated clothing for four to six weeks through multiple washings. If clothing is soaked in Permethrin as recommended by the manufacturer, the clothing will provide protection for several months. It is non-toxic to mammals and skin absorption is extremely low. It does not stain clothing.

In a study done in Alaska, permethrin-treated clothing coupled with 33% DEET to exposed skin provided 99.9% protection against insect bites compared to greater than 1000 bites per hour in the non-protected group.

### **Bed netting**

Bed nets treated with Permethrin provide a very high level of protection from mosquito bites. The density of the netting determines what other insects might be kept from entering the occupied area. Mesh of 300 holes per square inch is dense enough to keep out tiny sand flies.

### **Sunscreens**

Apply the sunscreen first and let it dry before applying the DEET over top.