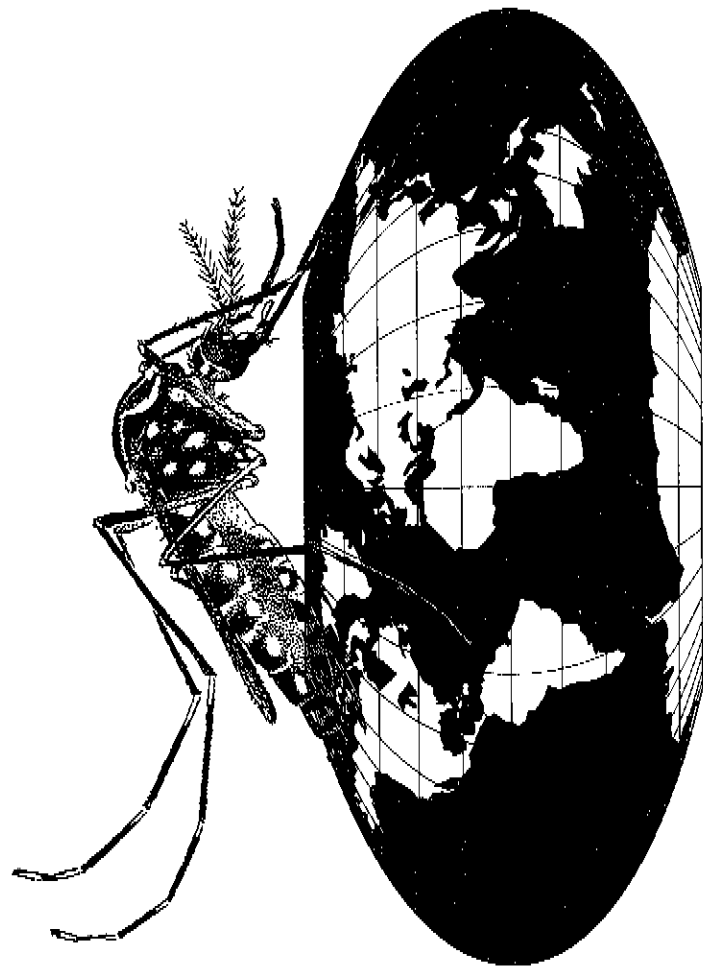


PREVENTING DENGUE and DENGUE HAEMORRHAGIC FEVER



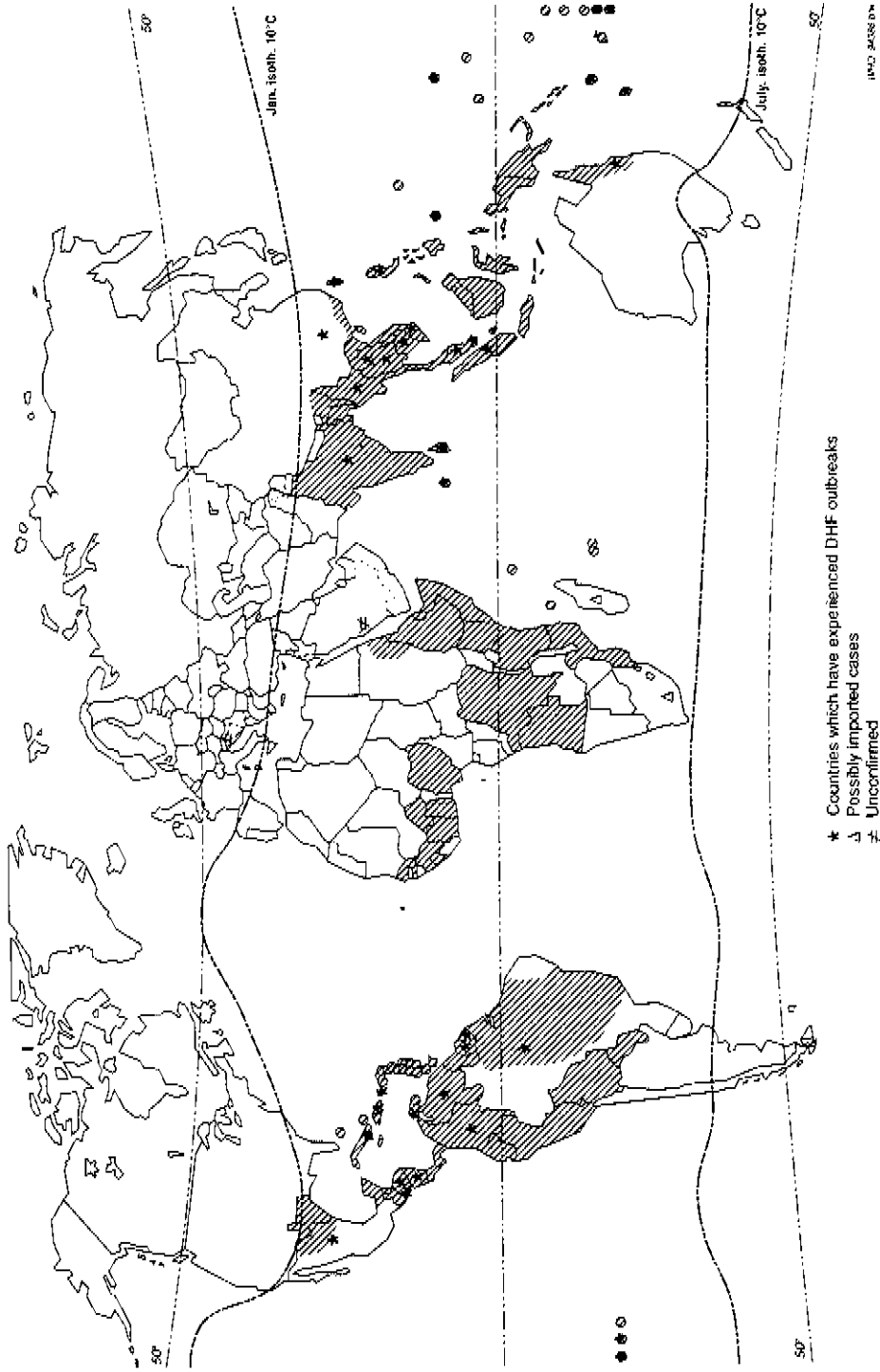
**A fact sheet for
municipal and
community leaders**



Division of Control of Tropical Diseases and
Division of Communicable Diseases
World Health Organization
Geneva

WHERE IS DENGUE FOUND?

The General Distribution of Dengue and/or Dengue Haemorrhagic Fever, 1975-1993



Dengue, like the mosquito that carries it, is found throughout tropical regions of the world. It is reported from over 100 countries, with approximately 2000 million people at risk. Annually there are millions of infections and at times tens of thousands of deaths. Dengue has now become the most important mosquito-borne virus disease in the world. It affects young and old, rich and poor alike, especially those living in densely crowded urban areas throughout the tropics.

WHY IS DENGUE IMPORTANT TO YOU AS A COMMUNITY LEADER?

Dengue fever and, in particular life-threatening DHF, often occur in massive epidemics. Dengue spreads rapidly, affecting a great many people during an epidemic, resulting in reduced work productivity but, most importantly causing the loss of lives.

*When this occurs, the number
of people who will survive will
depend on the actions that
you take now.*

TREATMENT OF DENGUE AND DHF

Up to 20% of people with severe dengue or DHF may die if not properly diagnosed and treated. Local physicians need to be specially trained to care for dengue/DHF patients, and laboratories should have the capacity to confirm the diagnosis.

*With proper care, less than
1-2% of patients with dengue
or DHF will die*

PROPER CLINICAL CARE SAVES LIVES

WHAT IS DENGUE?

Dengue is a serious viral disease transmitted by the bite of the mosquito, *Aedes aegypti*.

Dengue occurs in two forms: dengue fever and dengue haemorrhagic fever.

Dengue fever is a severe, flu-like illness that affects older children and adults but rarely causes death.

Dengue haemorrhagic fever (DHF) is a second more severe form, in which bleeding and occasionally shock occur, leading to death; it is most serious in children.

Persons suspected of having dengue fever or DHF must see a doctor at once. Dengue haemorrhagic fever is a deadly disease and early diagnosis and treatment can save lives. Unless proper treatment is given promptly, the patient may go into shock and die.

The symptoms of dengue fever vary according to the age and general health of the patient. Infants and young children may have a fever with a measles-like rash, which is difficult to distinguish from influenza, measles, malaria, infectious hepatitis and other diseases with fever. Older children and adults may have similar symptoms or symptoms ranging from mild illness to very severe disease.

CHARACTERISTICS OF DENGUE FEVER

- Abrupt onset of high fever
- Severe frontal headache
- Pain behind the eyes which worsens with eye movement
- Muscle and joint pains
- Loss of sense of taste and appetite
- Measles-like rash over chest and upper limbs
- Nausea and vomiting

CHARACTERISTICS OF DENGUE HAEMORRHAGIC FEVER AND SHOCK

- Symptoms similar to dengue fever
- Severe and continuous stomach pains
- Pale, cold or clammy skin
- Bleeding from the nose, mouth and gums and skin bruising
- Frequent vomiting with or without blood
- Sleepiness and restlessness
- Constant crying
- Excessive thirst (dry mouth)
- Rapid weak pulse
- Difficulty in breathing
- Fainting

DO NOT WAIT, SEE A DOCTOR IMMEDIATELY, IT IS CRUCIAL TO
TREAT QUICKLY ANYONE WITH THESE COMPLICATIONS

WHO IS MOST AFFECTED?

Children, tourists and travellers are usually at a higher risk for dengue transmission. However, adults living in endemic areas are in danger too.

THE DENGUE MOSQUITO

Aedes aegypti, the dengue mosquito, is a small, black and white insect with stripes on its legs and back. Mosquitos that are carrying dengue virus, will give the disease to humans when they bite.

They are approximately 5 mm in size:  5 mm



Magnified 5 times

WHEN DO DENGUE MOSQUITOS BITE?

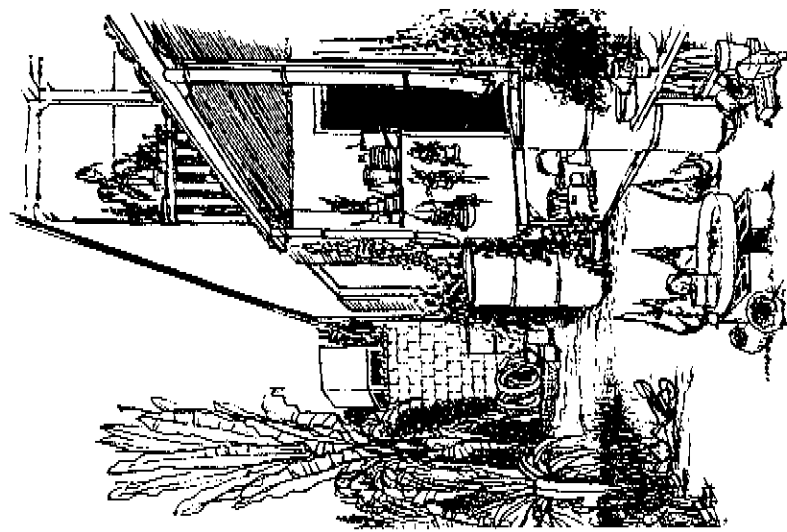
Dengue mosquitos bite in the early morning and the late afternoon.

WHERE DOES THE DENGUE MOSQUITO LIVE?

The mosquito rests **indoors**, in closets and other dark places. **Outside**, they rest where it is cool and shaded. The female mosquito lays her eggs in water containers in and around homes, schools and other areas in towns or villages. The larvae, known as wigglers, hatch from the mosquito eggs, and live in the water for about a week; they then change into a round pupal stage for one or two days, after which the adult mosquito emerges, ready to bite.

WHERE DOES THE DENGUE MOSQUITO BREED?

Dengue mosquitos breed in any water-catching or storage containers in shaded or sunny places. Favoured breeding places are—
Barrels, drums, jars, pots, buckets, flower vases, plant saucers, tanks, cisterns, bottles, tins, tyres, pans, plant saucers and roof gutters, refrigerator drip pans, catch basins, drains, soak-away pits, cement blocks, cemetery urns, plant leaf axils, bamboo stumps, tree cavities and a lot more places where rainwater collects or is stored.



DENGUE IS INCREASING

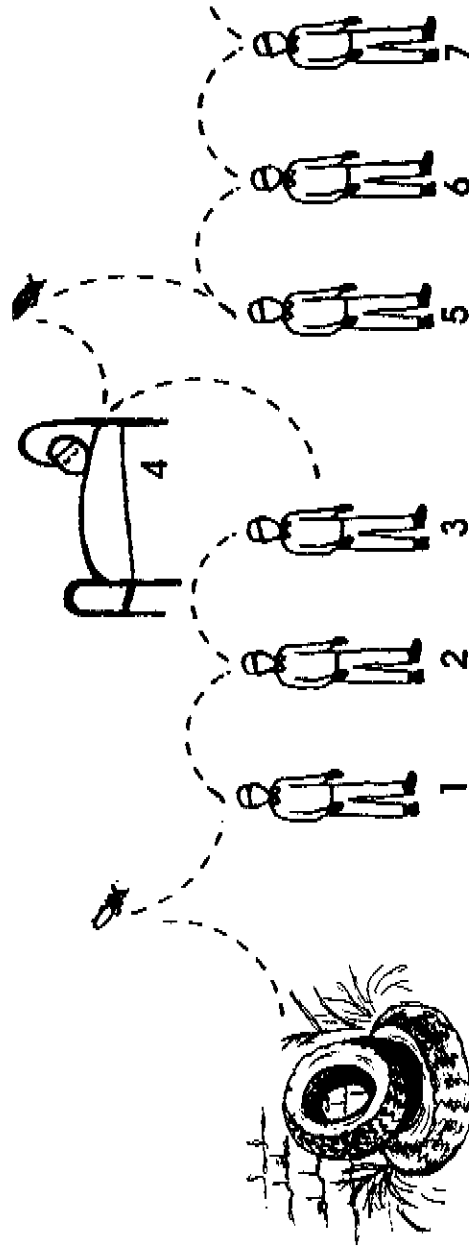
Why
Dengue Epidemics
are increasing

- **Increasing urban populations**
- **Expanding mosquito breeding due to:**
 - ✧ **Unreliable water supply**
 - ✧ **Traditional water storage practices**
 - ✧ **Poor garbage collection (creates more mosquito breeding places)**
 - ✧ **Changing lifestyles**
- **Rapid transportation:**
 - ✧ **Movement of infected humans**
 - ✧ **Spread of dengue mosquitos**

Other related factors: inadequate health education, limited financial resources, insufficient mosquito control programmes, and resistance of mosquitos to insecticides.

HOW IS DENGUE SPREAD?

Dengue is spread by the bite of an infected female, *Aedes aegypti* mosquito which has got the dengue virus by taking a blood meal on a person who is ill with dengue. The infected mosquito then transmits the disease through its bite to other people who in turn becomes ill, and the chain continues. The diagram below, illustrates this action.



There is no way to tell if a mosquito is carrying the dengue virus, therefore people must protect themselves from all mosquito bites, which will also protect against malaria and other mosquito-borne diseases.

HOW CAN DENGUE BE PREVENTED?

As there is no drug to cure dengue or vaccine to prevent it, there are **two key measures** that can be applied to prevent the spread of dengue.

1. Elimination of mosquito breeding places

- **Cover water containers**—Tight covers on water storage containers, will prevent the mosquitos laying their eggs there. If the cover is loose, mosquitos can go in and out.
- **Septic tanks and soak-away pits**—Cover and seal these, so that dengue mosquitos cannot breed there.
- **Removal of rubbish**—Garbage articles and other rubbish found around houses can collect rain water. They should be removed or smashed and buried in the ground or burned, where this is permissible.
- **Biological control**—Mosquito wigglers can be controlled by small larva-eating fish, such as guppies. These fish can be found in streams or ponds or obtained through pet shops. Bacterial pesticides will also kill mosquito wigglers.
- **Chemical control**—Safe and easily used larvicides such as temephos sand core granules can be placed in water containers to kill developing wigglers.

2. Prevent mosquito bites

People can protect themselves from mosquito bites by using any of the following means—

- **Mosquito coils and electric vapour mats**—Slow burning mosquito coils or electric vapour mats are effective in the rainy season, just after sunrise and/or in the afternoon hours before sunset, when dengue mosquitoes bite.
- **Mosquito nets**—Nets placed over sleeping places can protect small children and others who may rest during the day. The effectiveness of such nets can be improved by treating them with permethrin (a pyrethroid insecticide). Curtains (cloth or bamboo) can also be treated with insecticide and hung at windows or doorways, to repel or kill mosquitoes.
- **Repellents**—Mosquito repellents can be applied to exposed parts of the body where mosquitoes bite. Care should be taken in using repellents on small children and the elderly.
- **Screens**—Screens on windows and doorways are effective protection against the entry of mosquitoes in homes.
- **Protection of people sick with dengue**—Mosquitoes become infected when they bite people who are sick with dengue. Mosquito nets and mosquito coils will effectively prevent mosquitoes from biting sick people and help stop the spread of dengue.

Control of dengue outbreaks

Should a dengue epidemic occur within the community or municipality, it will be necessary for vector control measures to be carried out. These will include the use of insecticides applied through fogging or ultra-low-volume (ULV) spraying. This will reduce the numbers of adult dengue mosquitoes, thereby halting the spread of the epidemic. Members of the community will need to cooperate while spraying is being done leaving doors and windows open, allowing the insecticide to enter the house to kill mosquitoes resting indoors.

DENGUE VACCINE DEVELOPMENT

There is no vaccine for dengue, but promising work is in progress.

- A live, attenuated, vaccine for all four types of dengue is now in clinical trials in Thailand.
- Research is being conducted to develop vaccines for dengue using biotechnology and genetic engineering.
- **Provision of reliable water supply**
A reliable water supply is vital to prevent dengue fever. Water shortages force people to store water, providing breeding places for dengue mosquitoes.
- **Reliable rubbish collection**
Regular garbage collections will reduce potential mosquito breeding sites.
- **House-to-house inspections to control mosquito breeding**
Where appropriate, house-to-house inspections will determine whether mosquitoes are breeding around the houses. Inspectors can teach household members how to prevent mosquito breeding.

WHAT CAN COMMUNITY AND MUNICIPAL LEADERS DO TO STOP DENGUE?

- **Health education campaigns**

The first step in action against the dengue mosquito is to inform communities about what dengue is and what measures can be taken to combat it.

Below are some suggestions for consideration:

- *Hold community council meetings about dengue. Participants will decide if dengue is an important problem in the community.*
- *Invite municipal health leaders to participate in action decided on by community.*
- *Organize training sessions for volunteers: films, exhibits and lectures from health workers*
- *conduct surveys to determine mosquito problem.*
- *Use schoolchildren as agents for change to carry out inspections, and teach about where the dengue mosquito lives and how to control it.*
- *Organize house-to-house surveys and "one on one" teaching about dengue and the vector mosquito.*
- *Publicize the activity.*

- **Emergency preparedness**

Communities and municipalities must take preparatory measures to guard against epidemic outbreaks of dengue and DHF. Plans of action, must be formulated, in conjunction with national, state and local health authori-

ties. Such plans must include obtaining insecticide application equipment, stockpiling of insecticides, provision of vehicles to carry out spray treatment and other measures deemed necessary by community and health leaders if an epidemic threatens.

- **Garbage clean-up campaigns**

Garbage clean-up activities will have far reaching sustainable effects not only on the dengue mosquito, but also on houseflies, rodents and cockroaches. **The following are suggested:**

- *Invite the municipality to be involved and to provide trucks and personnel.*
- *Hold a community meeting to focus attention on clean-up day and its purpose.*
- *Advertise the clean-up day on radio and by posters.*
- *Encourage schoolchildren to participate.*
- *Get other community groups to participate.*

- **School campaigns**

The use of schools for the promotion of health and a dengue free community is vital. Students can be involved in clean-up and information campaigns. They will carry the message home to their parents and neighbours. Students can begin by cleaning up their school compound, then take action around their own homes.

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