Vectors are small organisms such as mosquitoes, bugs, ticks and freshwater snails, that can carry disease from person to person and place to place. Vector-borne diseases can cause serious illness and even lead to death. Chikungunya, dengue, Japanese encephalitis, kala-azar (visceral leishmaniasis), lymphatic filariasis, malaria and schistosomiasis are vector-borne diseases occurring in, among other places in the world, the South-East Asia Region. They can put our health at risk, at home and when we travel. This information booklet aims to provide useful information on how the general public can help to protect themselves and their families from these diseases.
Vector-borne Diseases

An information booklet

World Health Organization
Regional Office for South-East Asia
Table of Contents

Introduction ..........................................................1
Chikungunya fever.................................................2
Dengue fever and dengue haemorrhagic fever.......4
Japanese encephalitis ............................................6
Kala-azar ...............................................................8
Lymphatic filariasis...............................................10
Malaria................................................................12
Schistosomiasis .....................................................14
Introduction

Vectors are organisms that transmit pathogens and parasites from one infected person (or animal) to another, causing serious diseases in human populations.

Important vector-borne disease for the WHO South-East Asia Region, include chikungunya, dengue, Japanese encephalitis, kala-azar, lymphatic filariasis, malaria and schistosomiasis.

Vector-borne diseases are a serious threat to development as well as health, affecting the most economically vulnerable populations. Dengue is one of the fastest spreading infectious diseases of the twenty-first century – its profile is changing as it moves from urban to rural areas and to new geographical regions due to climate change. More than 1.3 billion people in this Region are at risk of malaria, as over 75% of the population live in malaria-prone areas.

This information booklet contains vital information on what you can do to protect yourself, your family and others from vector-borne diseases.
Chikungunya fever

Chikungunya fever is a viral illness that is spread by the bite of infected mosquitoes; these mosquitoes bite mostly in the daytime.

The disease resembles dengue fever, and is characterized by severe, sometimes persistent, joint pain (arthritis), accompanied with fever and often rash. The condition is rarely life threatening.

Chikungunya was reported recently from several countries of the South-East Asia Region, including India, and various Indian Ocean islands. Simultaneous occurrence of chikungunya and dengue fevers was observed in Maharashtra.

Treatment consists of mitigating pain and fever using mild anti-inflammatory drugs (such as paracetamol) and rest. Sometimes the recovery period can be prolonged. Persistent joint pain may require appropriate medication and therapy for long-term relief. Aspirin should be avoided, especially in patients below 18 years.
How to protect yourself

Prevent yourself from mosquito bites by:
- wearing clothing that covers as much of the body as possible, such as long-sleeved shirts and long trousers;
- using mosquito coils and electric vapour mats;
- using mosquito nets, coils or repellants to prevent mosquitoes acquiring the virus by feeding on already-infected persons.

Eliminate mosquito breeding sites by:
- draining water from coolers, tanks, barrels etc. every week;
- practicing “dry days” – dry your coolers once a week for 2–3 hours;
- removing unwanted construction materials or other waste and objects where water can collect.

No vaccine is available against chikungunya fever. Antibiotics have no role in the treatment of chikungunya. Say NO to use of antibiotics in chikungunya.
Dengue fever and dengue haemorrhagic fever

Dengue fever is an acute viral infection transmitted by the bite of an infected mosquito, *Aedes aegypti*, which bites during the daytime.

These mosquitoes breed in stored and exposed water collection vessels such as drums, jars, pots, buckets, flower vases, water tanks, discarded bottles, tyres, and water coolers.

Dengue fever manifests itself 4–7 days after the bite of an infected mosquito.

Symptoms:
- high fever
- pain behind the eyes
- headache
- body aches and joint pains.
- sometimes, skin rash

Dengue haemorrhagic fever, a potentially lethal complication of dengue fever, results in:
- high fever, restlessness
- severe and continuous pain in the abdomen
- bleeding from the nose, mouth and gums or skin
- bruising
- black stools
- pale or cold skin.

No vaccine or specific antiviral drugs are available.
How to protect yourself

Prevent breeding of mosquitoes in your vicinity:
- drain water from coolers, tanks, barrels etc. at weekly intervals;
- practice “dry days” – dry your coolers once a week for 2–3 hours;
- remove solid waste and objects where water collects.

Protect yourself from mosquito bites:
- Wear clothing that covers as much of the body as possible, such as long-sleeved shirts and long trousers.
- Use mosquito coils and electric vapour mats.
- Use mosquito nets and repellants for patients sick with dengue to prevent mosquitoes acquiring the virus by feeding on them.
- If dengue fever is suspected, avoid administration of aspirin and ibuprofen as these may increase bleeding and abdominal pain. Take paracetamol (acetaminophen) for fever and body aches.
- Seek medical advice immediately if bleeding manifests.

Antibiotics have no role in treatment of dengue fever.
Say NO to the use of antibiotics in dengue fever.
Japanese encephalitis

Japanese encephalitis (JE) is a viral disease transmitted by mosquitoes that breed in rice fields. Primarily a rural disease, if not treated early, JE can lead to death.

Infected waterbirds and pigs, who often show no sign of sickness, are the most common JE “reservoirs” in the chain of transmission to humans.

The disease mainly affects children, and causes infection of the brain and its covering membranes. Those who survive the disease are often left neurologically disabled.

The disease is characterized by:

- rapid onset of high fever
- headache
- neck stiffness
- disorientation
- coma
- seizures
- paralysis.

Intensive medical and nursing care may lead to complete recovery or minimize neurological complications.

Vaccines against JE are available.
How to protect yourself

- Prevent mosquito bites using repellants and bednets.
- Vaccination is recommended for those travelling to or living in JE-endemic areas.
- JE is a medical emergency; rush any patient with symptoms to the nearest health facility.
- No specific antiviral treatment is available.

Antibiotics have no role in the treatment of Japanese encephalitis.
Say NO to antibiotics in JE.
Kala-azar

Kala-azar (visceral leishmaniasis) is transmitted by the sandfly, *Phlebotomus argentipes* and caused by a parasite, *Leishmania donovani*. In South-East Asia, humans are the sole reservoir of this disease.

The disease manifests after 2–6 months of being bitten by an infected sandfly.

Clinical features:
- prolonged fever
- anaemia
- malaise
- anorexia
- weight loss
- darkening of the skin
- lymph node enlargement
- enlargement of the abdomen – due to enlarged spleen and liver
- pancytopenia (decrease in red and white blood cells and platelets)
- progressive emaciation (extreme weight loss)

No vaccine is currently available against kala-azar. Reliable diagnostic tools and efficacious medicines are available to cure this disease. Control of sandflies is essential to stop the transmission of infection.
How to protect yourself

As no vaccines are available that can prevent kala-azar, best way is to reduce contact between human and sandflies.

When travelling or living in an endemic places:

- try to reduce exposure to sandflies, which are usually active between dusk and dawn;
- minimize the amount of exposed skin;
- use insect repellants;
- stay in well-screened areas;
- use bednets (insecticide treated ones if possible);
- reduce/eliminate possible sandfly breeding places in and around houses;
- accept services offered by national programmes including indoor residual spraying activities;
- go for early diagnosis, if clinical features of kala-azar are suspected;
- take the full course of recommended anti-kala-azar medicines.
Lymphatic filariasis

Lymphatic filariasis is a mosquito-borne parasitic disease caused by nematode parasites: Wuchereria and Brugia. The main mosquitoes types that transmit the parasites are Culex, Aedes and Mansonia. Clinical manifestations of filariasis appear after several bites by infected mosquitoes.

Lymphatic filariasis manifests clinically after 3–12 months of being bitten by infected mosquitoes. The most characteristic and visible feature of chronic filariasis is swollen legs—commonly called elephantiasis.

Clinical features include any of the following during the course of the disease:

- fever
- tender swelling of lymph vessels and glands (lymphangitis and lymphadenitis)
- swelling of legs (lymphodema)
- elephantiasis
- hydrocele
- tropical pulmonary eosinophilia syndrome
  - cough
  - shortness of breath
  - wheezing
  - high levels of IgE (immunoglobulin E)
  - antifilarial antibodies.

No vaccine is available against lymphatic filariasis.

Using medicines, lymphatic filariasis can be prevented and treated.

Chemoprophylaxis through mass drug administration is widely used.
Prevent human–mosquito contact.
If you live in an endemic area:
- Sleep under mosquito nets (preferably an insecticide treated bednet.)
- Wear clothing that covers as much of the body as possible, such as long-sleeved shirts and long trousers.
- Use mosquito repellent on exposed skin.
- Reduce/eliminate possible mosquito breeding places in and around houses.
- Accept and promote services offered by national programmes at the community level, such as annual mass administration of chemoprophylactic medicines (diethyl carbamazine citrate and albendazole).
- Avail of health-care services for reducing disability (hydrocoele, elephantiasis etc.) caused by lymphatic filariasis.
Malaria

Malaria is caused by *Plasmodium* parasites. The parasites are spread to people through the bites of infected *Anopheles* mosquitoes, which bite mainly between dusk and dawn.

Malaria manifests itself 9–14 days after the mosquito bite.

Clinical features include:

- high fever
- headache
- chills and shivers
- nausea
- vomiting, convulsion and unconsciousness in severe malaria.

No malaria vaccine is available, but malaria is preventable and curable. *Prophylactic* (preventative) drugs are also available.
How to protect yourself

- Cover doors and windows with wire mesh/screens.
- Use mosquito nets (preferably insecticide treated).
- Arrange for indoor residual spraying with insecticide.
- Destroy mosquito-breeding places around your habitat that reduces the number of mosquitoes.
- Apply insect repellants to the skin of the exposed part of the body.
- Wear clothing that covers as much of the body as possible, such as long-sleeved shirts and long trousers.
- While visiting malaria endemic areas, take maximum protection, take drug prophylaxis and protect yourself from mosquito bites.
- Start prophylaxis medicines before arrival to a malarious area and continue after return as prescribed.
- If symptoms are suggestive of malaria, seek immediate medical help.

Take antimalarial medicines in prescribed doses and for the full recommended number of days. Help prevent emergence of resistance to antimalarials.
Schistosomiasis

Schistosomiasis, also known as bilharzia, is a disease caused by parasitic worms (Schistosoma mansoni, S. haematobium and S. japonicum).

Schistosomiasis occurs in places with poor sanitation. The parasites live in certain types of freshwater snails. A person can become infected when injured skin comes in contact with freshwater where living snails are infected with schistosomes.

In South-East Asia, schistosomiasis is currently endemic only in three isolated areas in Central Sulawesi Province, Indonesia.

Clinical features of severe infections include:
- rash or itchy skin
- chills
- muscle aches
- enlarged liver
- difficulty in passing urine
- fever
- cough
- abdominal pain
- blood in the stool or blood in the urine, and
- seizures of brain or spinal cord, paralysis, or spinal cord inflammation.

No vaccine is available to prevent the infection. Effective medication is available and praziquantel is the recommended drug.
Prevent contact with contaminated water.

Avoid swimming or wading in freshwater when you are in areas where schistosomiasis is prevalent.

Prevent contamination of water with faeces and urine of patients.

Wash body (feet and hands) properly with soap after working in the field/jungle.

Drink safe water.

Use safe water for bathing.

Take the complete course of treatment if medicines are prescribed.

How to protect yourself
Vectors are small organisms such as mosquitoes, bugs, ticks and freshwater snails, that can carry disease from person to person and place to place. Vector-borne diseases can cause serious illness and even lead to death. Chikungunya, dengue, Japanese encephalitis, kala-azar (visceral leishmaniasis), lymphatic filariasis, malaria and schistosomiasis are vector-borne diseases occurring in, among other places in the world, the South-East Asia Region. They can put our health at risk, at home and when we travel. This information booklet aims to provide useful information on how the general public can help to protect themselves and their families from these diseases.