

# **Prevention of Mosquito-borne Diseases**

**September 2025**

- Common mosquito-borne diseases
- Prevention of mosquito-borne diseases

# Mosquito-borne Diseases

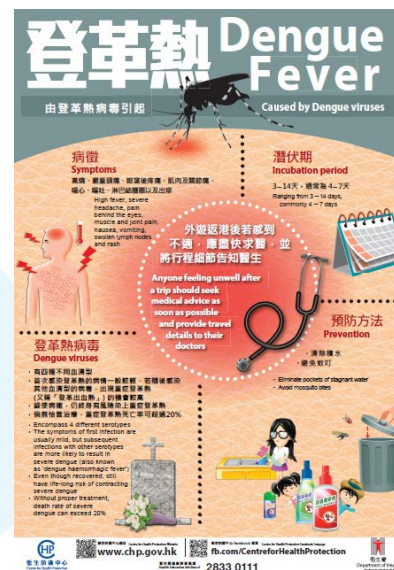
- Common diseases
  - Dengue fever
  - Japanese encephalitis
  - Malaria
  - Zika virus infection
- Others
  - Chikungunya fever, West Nile virus infection, Yellow fever

# Dengue Fever

# Dengue Fever

## ■ Causative agent

- Dengue viruses
- encompass 4 different serotypes
- Each of which can lead to dengue fever and severe dengue (also known as 'dengue haemorrhagic fever')



# Dengue Fever – Clinical Features

- High fever
- Severe headache
- Pain behind the eyes
- Muscle and joint pain
- Nausea and vomiting
- Swollen lymph nodes
- Rash

# Dengue Fever – Clinical Features

- Some infected people **may not develop apparent symptoms**
- Some may only have mild and non-specific symptoms such as fever and rash

# Dengue Fever – Clinical Features

- Symptoms of first infection
  - usually mild
  - Once recovered, lifelong immunity to that serotype of dengue virus will develop
- Subsequent infections with other serotypes of dengue virus are more likely to result in severe dengue



# Dengue Fever – Mode of Transmission

- Transmitted to humans through the bites of infective **female *Aedes* mosquitoes**
- After feeding on a dengue-infected person, the mosquito becomes infected and may spread the disease by biting other people
- Vectors
  - *Aedes albopictus*
  - *Aedes aegypti*



Source of photo:  
Food and Environmental Health Department

# Dengue Fever – Mode of Transmission

- Cannot be spread directly from human to human
- Low possibility of maternal transmission from a pregnant mother to her baby
- In Hong Kong, dengue fever is mainly spread by *Aedes albopictus*
- *Aedes aegypti* has not been found in recent years in Hong Kong

# Dengue Fever-Incubation Period

- 3 to 14 days (Commonly 4 to 7 days)

# For more information about Dengue Fever

- Please visit the Centre for Health Protection website  
<https://www.chp.gov.hk/en/features/38847.html>

# Japanese Encephalitis

# Japanese Encephalitis

- **Causative agent**

- Japanese encephalitis virus

- **Vector**

- *Culex tritaeniorhynchus* (most active from dusk till dawn)

# Japanese Encephalitis – Clinical Features

- Most infections occur without apparent symptoms or with mild symptoms such as fever and headache
- More severe infection is characterised by rapid onset of headache, high fever, neck stiffness, impaired mental state, coma, convulsions (especially in children), spastic paralysis and even death

# Japanese Encephalitis – Mode of Transmission

- The mosquito breeds where there is abundant water such as rice paddies
- Becomes infected by feeding on **pigs** or **wild birds** infected with the virus. The infected mosquito transmits the virus to humans and animals during biting



# Japanese Encephalitis – Mode of Transmission

- While Japanese encephalitis is principally mosquito-borne, a human case transmitted by blood transfusion was recorded in Hong Kong
- In addition, overseas scientific literature showed that, based on the nature of similar flaviviruses, organ transplant is also considered to be a potential mode of transmission

# Japanese Encephalitis – Incubation Period

- Symptoms usually start around 4 – 14 days after being infected

# Japanese Encephalitis – Vaccination

- Vaccination for Japanese encephalitis is available in Hong Kong; it is safe and effective
- However, it is generally not recommended for members of the general public

# Japanese Encephalitis – Vaccination

- Vaccination is recommended for travellers who plan to stay one month or longer in endemic areas, particularly in rural areas
- For short-term (less than one month) travellers, if they plan to have significant/ extensive outdoor or night-time exposure in rural areas during the transmission season of the disease, they should also receive vaccination

# For more information about Japanese Encephalitis

- Please visit the Centre for Health Protection website  
<https://www.chp.gov.hk/en/features/49712.html>

# Malaria

# Malaria

- **Causative agent**

- A group of malaria parasites (commonly found in many parts of tropical and sub-tropical areas where the climate is warm, like Africa, South-East Asia and South America)

- **Vector**

- Anopheline mosquito

# Malaria – Clinical Features

- Fever
- Chills
- Headache
- Muscle pain and fatigue
- Cough
- Vomiting
- Diarrhoea and abdominal pain



# Malaria – Complications

- Include anaemia, generalised convulsion, circulatory collapse, organ failure (such as kidney failure) and coma and **death** if the disease is not treated promptly

# Malaria – Mode of Transmission

- When the Anopheline mosquito bites a malaria patient, the mosquito becomes infected and will pass on the disease when it bites another person
- Malaria is not transmitted from person to person
- Can be transmitted through contaminated blood or blood product transfusion, organ transplant, or shared needles or syringes
- May also be transmitted from a mother to her foetus/newborn baby before or during delivery

# Malaria – Incubation period

- The incubation period varies with different species of Plasmodium.
- This usually ranges from 7 to 30 days but may be up to months or even longer after the bite of an infected Anopheline mosquito

# For more information about Malaria

- Please visit the Centre for Health Protection website  
<https://www.chp.gov.hk/en/healthtopics/content/24/30.html>

# Zika Virus Infection

# Zika Virus Infection

- **Causative agent**

- Zika virus

- **Vectors**

- *Aedes albopictus*
- *Aedes aegypti*

# Zika Virus Infection – Clinical Features

- Most people infected with Zika virus infection are **asymptomatic** (i.e. no symptoms)
- Include skin rash, fever, conjunctivitis, muscle and joint pain, malaise and headache.
- These symptoms are generally mild and usually last for 2 – 7 days

# Zika Virus Infection

- Zika virus infection during pregnancy is a cause of microcephaly and other congenital malformations in the infant. Congenital malformations can occur following both symptomatic and asymptomatic infection. Zika infection in pregnancy can also cause complications such as fetal loss, stillbirth and preterm birth
- Zika virus infection can also cause Guillain-Barré syndrome, neuropathy and myelitis



# Zika Virus Infection – Mode of Transmission

- Zika virus is primarily transmitted to humans through the bite of an infected *Aedes* mosquito
- *Aedes aegypti*, which is currently not found in Hong Kong, is considered the most important vector
- Other *Aedes* mosquito species such as *Aedes albopictus*, which is commonly found in Hong Kong, are also potential vectors

# Zika Virus Infection – Other Mode of Transmission

- Zika virus can also be transmitted from mother to fetus during pregnancy, as well as through sexual contact, transfusion of blood and blood products, and organ transplantation

# Zika Virus Infection-Incubation period

- ranges from 3 - 14 days

# Zika Virus Infection – Vaccination

- At present, there is **no** vaccine available against Zika virus infection

# Zika Virus Infection – Special Notes for pregnant women

- Pregnant women should **pay close attention** to the infection risk if they travel to areas with active transmission and strictly follow recommendations to prevent mosquito bites and sexual transmission during travel
- Pregnant women are advised to use DEET-containing insect repellent during travel to areas with active transmission
- Sexual partners of pregnant women living in or returning from areas of active transmission should practice safer sex or abstain from sexual activity throughout pregnancy

# Zika Virus Infection – Pregnant women are advised to

Pregnant women returning from areas with active transmission are advised to:

- Attend antenatal follow up regularly and inform the attending doctor about recent travel history
- Observe for symptoms of Zika virus infection and seek medical advice as soon as possible if feeling unwell
- Apply insect repellent for at least 3 weeks after arrival in Hong Kong.

# Zika Virus Infection – Prevention of Sexual Transmission

- All travellers should practice safer sex (including correct and consistent use of condoms) or abstain from sexual activity during travel to areas of active transmission
- Male and female travellers returning from areas of active transmission should practice safer sex or abstinence for at least 3 months and 2 months respectively upon return

# For more information about Zika Virus Infection

- Please visit the Centre for Health Protection website  
<https://www.chp.gov.hk/en/features/43086.html>



# Chikungunya Fever

# Chikungunya Fever

- Causative agent
  - is a mosquito-borne viral disease caused by the chikungunya virus

# Chikungunya Fever-Clinical features

- Fever and debilitating joint pain
- muscle pain
- Headache
- Nausea
- fatigue and rash
- Symptoms are generally self-limiting and last for a few days, while in some cases joint pain may persist for several months, or even years

# Chikungunya Fever - Incubation period

- ranges from 2 to 12 days, commonly 3 to 8 days

# Chikungunya Fever-Clinical features

- Severe symptoms and deaths from chikungunya are rare and usually related to other coexisting health problems. Most patients recover fully. Occasionally, chikungunya virus can cause severe complications of the eye, heart and nerves. Newborns, people of older age or patients with underlying medical conditions are at higher risk for more severe disease
- Available evidence suggests that people who have been infected once are likely to be immune from future infections

# Chikungunya Fever-Mode of transmission

- Chikungunya fever is most commonly transmitted to humans through the bites of infective female *Aedes* mosquitoes. When a patient suffering from chikungunya fever is bitten by a vector mosquito, the mosquito may be infected and it may spread the disease by biting other people
- In Hong Kong, the vector *Aedes aegypti* is not found, but *Aedes albopictus*, which can also spread the disease, is a mosquito commonly found in the locality. These mosquitoes can be found biting throughout daylight hours and there may be peaks of activity in the early morning and late afternoon
- Chikungunya virus can also be rarely transmitted from mother to newborn around the time of birth

# Chikungunya Fever-Vaccination

- At present, there is no locally registered chikungunya fever vaccine available in Hong Kong

# For more information about Chikungunya Fever

- Please visit the Centre for Health Protection website  
<https://www.chp.gov.hk/en/healthtopics/content/24/6122.html>



# West Nile virus infection

# West Nile virus infection

- Causative agent

West Nile Virus which belongs to the family *Flaviviridae*

- mainly circulates between birds and mosquitoes. Humans, horses and other mammals can also be infected

# West Nile virus infection-Incubation period

- usually ranges from 3 to 14 days

# West Nile virus infection-Clinical features

- Most infected people have no symptoms
- About 20% may develop symptoms such as fever, headache, tiredness, body aches, nausea, vomiting, skin rash and swollen lymph glands
- Less than 1% of infected patients will develop a more severe form of disease that affects the nervous system, including inflammation of the brain (encephalitis) and/ or inflammation of the membranes around the brain and spinal cord (meningitis)
- These patients may present with headache, high fever, stiff neck, stupor, disorientation, coma, tremors, convulsions, muscle weakness and paralysis
- Elderly and immunocompromised people are at a higher risk of developing severe disease

# West Nile virus infection-Mode of transmission

- The infection is primarily transmitted by bites of infected mosquitoes, principally of the *Culex* species
- The mosquitoes become infected when they feed on infected birds, and spread the virus to humans and other animals during feeding
- It is not transmitted from person-to-person through close contact
- Nevertheless, there have been reports that the virus spread through blood transfusion, organ transplantation, and from mother-to-baby during pregnancy or breastfeeding

# West Nile virus infection-Vaccination

- There is no human vaccine against WNV infection.

# For more information about West Nile virus infection

- Please visit the Centre for Health Protection website  
<https://www.chp.gov.hk/en/healthtopics/content/24/1472.html>

# Yellow Fever



# Yellow Fever

- **Causative agent**

mosquito-borne disease caused by the yellow fever virus

# Yellow Fever-Incubation period

- ranges from 3 to 6 days

# Yellow Fever-Clinical features

- The majority of persons infected with yellow fever virus have no or only mild symptoms,
- such as fever, muscle pain, backache, headache, loss of appetite, and nausea or vomiting
- For most patients, these symptoms disappear after 3 to 4 days. A small proportion of the cases will progress to a more severe form of the disease, including high fever, jaundice, bleeding, shock, organ failure and sometimes death
- Fatality rate among severe cases is about 50%

# Yellow Fever-Mode of transmission

- Yellow fever virus is transmitted to humans through the bites of infective *Aedes* or *Haemagogus* mosquitoes, primarily *Aedes aegypti*
- Mosquitoes feed on infected hosts (mainly monkeys), and then pass on the virus when they feed on other humans or animals
- Yellow fever virus can also be rarely transmitted from mother to newborn around the time of birth

# Yellow Fever-Vaccination

- Vaccination

Vaccination is the most important means of preventing yellow fever. The yellow fever vaccine is generally safe, and a single dose provides life-long protection against the disease

# For more information about Yellow Fever

- Please visit the Centre for Health Protection website

<https://www.chp.gov.hk/en/healthtopics/content/24/25044.html>

# Prevention of Mosquito-borne Diseases

# Prevention of mosquito bites

- Wear loose, light-coloured long-sleeved tops and trousers
- Use DEET-containing insect repellent on exposed parts of the body and clothing
  - Pregnant women and children of 6 months or older can use DEET-containing insect repellent. In general, use DEET of up to 30% for pregnant women and up to 10% for children
- Take additional preventive measures when engaging in outdoor activities:
  - Avoid using fragrant cosmetics or skin care products
  - Re-apply insect repellents according to instructions
  - If both insect repellents and sunscreen are used, apply insect repellents after sunscreen



# Prevention of mosquito proliferation

- Prevent accumulation of stagnant water
  - Change the water in vases once a week
  - Avoid using saucers underneath flower pots
  - Cover water containers tightly
  - Ensure air-conditioner drip trays are free of stagnant water
  - Put all used cans and bottles into covered dustbins
- Control vectors and reservoir of the diseases
  - Store food and dispose of garbage properly

# Advice for travellers

- Take preventive measures to avoid mosquito bites. For children who travel to countries or areas where mosquito-borne diseases are endemic or epidemic and where exposure is likely, children aged 2 months or above can use DEET-containing insect repellents with a concentration of DEET up to 30%. For details about the use of insect repellents and the key points to be observed, please refer to '[Tips for using insect repellents](#)'
- If going to affected areas or countries, arrange medical consultation at least 6 weeks before the trip, have extra preventive measures to avoid mosquito bites

# Advice for travellers

- If travelling in endemic rural areas, carry a portable bed net and apply permethrin (an insecticide) on it. Permethrin should NOT be applied to the skin. Seek medical attention promptly if feeling unwell
- Scientific studies have shown that infected persons can transmit the virus to mosquitoes through mosquito bites even if they remain asymptomatic or before their onset of symptoms, leading to further spread of the disease. Hence, travellers who **return from affected areas should apply insect repellent for 14 days after arrival** to prevent mosquito bites. If feeling unwell e.g. having a fever, the person should seek medical advice promptly, and provide travel details to the doctor

# Enquiries / Websites

- Centre for Health Protection, Department of Health  
Website: [www.chp.gov.hk](http://www.chp.gov.hk)
- Travel Health Service, Department of Health  
Website: [www.travelhealth.gov.hk](http://www.travelhealth.gov.hk)
- Food and Environmental Hygiene Department  
☎ 2868 0000 or ☎ 1823  
(Both are 24-hour hotlines handled by “1823”)  
Website: [www.fehd.gov.hk](http://www.fehd.gov.hk)

# Thank you!