

# Mosquito-borne diseases

## So, what about mosquitoes?

In the Northern Territory (NT) there are over 100 species but only about 20 are pest or problem mosquitoes. They live and breed in a variety of habitats. Some of the species are capable of spreading diseases that are potentially harmful to both humans and pets.

Exposure to large numbers of mosquitoes increases the risk of acquiring a mosquito-borne disease.

## What diseases do mosquitoes spread?

### *Murray Valley encephalitis (MVE) virus disease*

This is a rare disease but can cause serious illness and death. It is characterised by headaches, fever and confusion and is spread by the common banded mosquito. Outbreaks occur sporadically towards the end of the wet and early dry season. There are usually 1 or 2 cases a year in the NT.

### *Kunjin virus disease*

This is also a rare disease similar but generally milder than Murray Valley encephalitis. The virus is also spread by the common banded mosquito.

### *Ross River virus disease*

This potentially debilitating disease results in rash, fever, swelling and pain in the joints and is spread by a number of mosquito species including the salt marsh mosquito. There are usually 250-450 cases every year in the NT.

### *Barmah Forest virus disease*

This disease is less common but similar to Ross River virus disease and is generally milder. There are usually 50-130 cases in the NT every year.

## What diseases are also spread by mosquitoes, but NOT in the NT?

### *Malaria*

The last local malaria case occurred in the NT in 1962 and Australia was certified malaria free in 1981.

While mosquitoes capable of spreading the malaria parasite are present in the NT the disease has been eliminated. The parasite could be re-introduced into

the NT by infected people returning or visiting from overseas and infecting local *Anopheles* mosquitoes. It is therefore important that those recently returned from malarious areas seek urgent medical attention if they develop symptoms of malaria (fever, night sweats, muscle pains, headache, vomiting). People proposing to visit countries with malaria should consult their doctor regarding anti-malarial prophylactic treatment.

### *Dengue fever*

*Aedes aegypti*, the mosquito species capable of spreading dengue fever virus disappeared from the NT in the 1950s with no cases of dengue fever transmitted in the NT since then. Recent incursions of the mosquito on Groote Eylandt in 2006 and in Tennant Creek in 2004 and again in 2011 triggered rigorous *Ae. aegypti* elimination programs which were successful.

*Ae. aegypti* are found in nearby overseas countries and in northern Queensland and could potentially be introduced into the NT. Old tyres, pot plant drip trays or any receptacle that has held water could contain drought resistant mosquito eggs and should not be brought into the NT from north Queensland.

Dengue fever is characterised by fever, headache and severe muscle and joint pain.

### *Zika virus infection*

Zika is a mosquito-borne flavivirus that is closely related to dengue. Zika can be found in animals in many parts of Asia and Africa. Between 2013 and 2015 large outbreaks of Zika occurred in a number of Pacific countries. In 2015 and 2016 large outbreaks have occurred in the Americas.

It is spread most commonly by the dengue mosquito (*Ae. aegypti*) but other mosquitoes have been considered as possible transmitters. To date, none of the mosquitoes thought to be potential transmitters are found in the NT. Zika virus is also transmitted sexually.

There is evidence that the Zika virus is a cause of microcephaly and Guillain-Barré Syndrome. All people travelling to Zika endemic countries should take steps to prevent mosquito bites, and high risk people such as pregnant women and couples trying to conceive should consult with their health care provider before travel.

### Chikungunya virus disease

Chikungunya is a disease similar to Ross River virus disease. It is found mostly in West and East Africa, around the Indian Ocean, Asia and South East Asia. It is usually spread by the dengue mosquito (*Ae. aegypti*) but potentially could be spread by NT mosquitoes. Returned travelers with symptoms should see their doctor for a blood test.

### Japanese encephalitis virus disease

The Japanese encephalitis (JE) virus is not found in the NT, however the mosquito capable of spreading it is present. JE is a potentially fatal disease and was first found in Australia in 1995. Since then there have been 5 reported cases in Australia, mainly in the Torres Strait region.

### What measures are taken to prevent mosquito-borne diseases in the NT?

Medical Entomology, in conjunction with the Department of Agriculture and Water Resources, environmental health officers and local government conduct mosquito surveillance, monitoring and control programs in major towns and provide advice and conduct a public mosquito awareness service. To prevent the establishment of *Ae. aegypti*, *Ae. albopictus* and other exotic mosquitoes in the NT, comprehensive exotic mosquito surveillance, detection and control programs are ongoing at NT international sea and airports and in major NT towns.

### What measures can be taken against mosquito-borne diseases in the NT?

Elimination of breeding areas around the home and use of personal protective measures are the best ways to avoid mosquito-borne diseases. Pregnant women should discuss their travel plans with their doctor prior to travel.

#### Personal protective measures

##### Houses

- screen all doors and windows
- all doors should be self-closing and open outwards.

##### Outdoor activities

- screen tents
- use repellents \* †
- wear loose light-coloured clothing with long sleeves, long trousers and socks.

#### Locations

- recognise and avoid exposure at times and locations of mosquito activity e.g. large shallow vegetated swamps
- store all containers which hold water (tins, tyres, jars, buckets) out of the rain or discard.
- keep fish ponds stocked with fish. Keep edges of ponds and drains clear of grass
- keep swimming pools full and properly maintained. Fix leaking taps
- fill or drain depressions in the ground that hold water. Keep drains clean
- screen all septic tank vents. Seal all gaps. Flush disused toilets once a week
- screen rainwater tanks. Ensure guttering is not holding water. Treat tanks with methoprene briquettes
- empty pot plant drip trays once a week or fill with sand, or treat monthly with 4 methoprene pellets. Empty and wipe clean any pet/bird drinking containers weekly
- use methoprene pellets or briquettes for short term larval control
- for short term adult mosquito control apply bifenthrin residual.

\* di-ethyl-toluamide (DEET) or picaridin containing formulations. Lotions and gels are more effective and long lasting than sprays.

† Use allethrin pad candle heated mosquito lanterns or gas operated allethrin mosquito protection devices in patio or veranda or other outdoor situations.

#### For more information contact your nearest Centre for Disease Control.

Darwin	8922 8044
Katherine	8973 9049
Alice Springs	8951 7540
Tennant Creek	8962 4259
Nhulunbuy	8987 0357

<https://health.nt.gov.au/professionals/centre-for-disease-control/cdc-contacts>

For more information on mosquitoes and virus ecology contact Centre for Disease Control, Medical Entomology on 8922 8901.