

# EXOTIC

## Chikungunya fever

### Fact sheet

March 2024

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#### Key points

- Chikungunya fever is a viral, mosquito-borne disease of humans.
- The disease primarily occurs in Africa, Asia and the Americas, with large outbreaks becoming more frequent in many endemic regions and occasional outbreaks in other areas.
- Chikungunya is **not** present in Australia.
- Chikungunya is a nationally notifiable human disease in Australia (see *Surveillance and management*).
- The necessary mosquito vectors are present in areas of Australia, however the role that wild or feral animals might play in the possible establishment and spread of chikungunya in Australia is not known.

#### Aetiology

Chikungunya virus is an alphavirus in the family *Togaviridae*. It is a single-strand RNA virus <sup>[1]</sup>.

#### One Health implications

**Wildlife and the environment:** there is little evidence that Australian wildlife would be involved in the epidemiological spread of chikungunya virus or be affected by infection however further research is needed in this area.

**Domestic animals:** the risk to domestic animals appears low.

**Humans:** the Australian human population may be at increasing risk from chikungunya virus. An outbreak could have a significant impact on health, the safety of blood products and tourism <sup>[2]</sup>.

#### Natural hosts

Chikungunya virus circulates primarily through a sylvatic cycle between forest-dwelling mosquitoes and non-human primates such as vervet monkeys (*Cercopithecus aethiops*), Guinea baboons (*Papio papio*), patas monkeys (*Erythrocebus patas*) and crab-eating macaques (*Macaca fascicularis*). At times there is spillover into the human population where it may be maintained by mosquitoes transferring virus from viraemic humans to available non-immune hosts. The virus has also been found to cycle through a range of other species including bushbabies (*Galago senegalensis*), striped ground squirrels (*Xerus erythropus*), yellow bats (*Scotophilus* sp.) and birds all of which may potentially contribute to human outbreaks <sup>[2, 3]</sup>. Surveys of wild animals in Asia and Africa have

shown serological evidence of chikungunya virus infection in other species, including elephants and buffalo [4-6]. It has been proposed that cattle could act as a reservoir for the virus. However, a study in the Central African Republic found only one serologically positive individual out of 183 Zebu cattle tested [7].

## World distribution and occurrences in Australia

Chikungunya virus is endemic in Africa, India, south-east Asia and the western Pacific [8, 9]. It appeared in Italy and France in 2007 and some Caribbean islands in 2013. Since 2004 outbreaks have become more frequent and widespread [10]. Only imported cases have occurred in humans in Australia, with an increase in these cases in the past decade [2].

## Epidemiology

The virus is most commonly transmitted by the dengue mosquito (*Aedes aegypti*) and by the Asian tiger mosquito (*A. albopictus*). In Australia, *A. aegypti* only occurs in north Qld and *A. albopictus* on Torres Strait islands [2]. However, in 2014 both mosquito species were found in insect traps in Darwin harbour [11]. Other Australian mosquito species could potentially act as competent vectors for this virus but they are not closely associated with human habitation [12].

The incubation period of the disease in humans ranges is usually three to seven days. Asymptomatic infections occur in 3-25% of cases [13].

The transmission cycle of chikungunya virus is characterized by a periodicity of three to four years. These cycles are probably related to the immune status of the monkeys and to the percentage of the simian population susceptible to infection [3].

## Clinical signs

Signs and symptoms in humans include fever, severe joint pain and swelling, headache, fatigue, muscle pain and rash. Most people recover completely in a few weeks. Some patients have prolonged fatigue lasting many weeks or joint pain or arthritis which may last for months. Occasionally, more severe complications can occur but fatalities are rare [1].

## Diagnosis and treatment

Diagnosis in humans is based on clinical signs, history and laboratory testing (serology via ELISA, PCR or viral culture) [2]. Differential diagnoses in humans include diseases caused by other alphaviruses such as Ross River virus, Barmah Forest virus and dengue fever, and Zika virus. In humans, acute and convalescent serum samples should be collected at least three weeks apart. PCR or viral culture can be used to detect the presence of viral RNA in serum [13]. A range of serological tests have been used to detect antibody response to chikungunya infection in animals [3-7, 14].

There is no vaccine or specific antiviral treatment currently available for chikungunya fever in humans. Treatment for humans is symptomatic.

## Prevention and control

The best way to prevent chikungunya virus infection in humans is to control mosquitoes and avoid mosquito bites. Infected persons should avoid further mosquito exposure so they can not contribute to the transmission cycle.

## Research

Research is required to develop specific models incorporating ecological, entomological and virological factors to help predict future outbreaks. Further improvement in diagnostic testing is necessary for early detection and effective vector control and management. Research is also needed into the development of possible therapeutics and an effective vaccine <sup>[13]</sup>.

## Surveillance and management

Chikungunya is a nationally notifiable human disease in Australia. Australia's National Notifiable Diseases Surveillance System (NNDSS) includes a surveillance for chikungunya ([www.health.gov.au/diseases/chikungunya-virus-infection#surveillance-and-reporting](http://www.health.gov.au/diseases/chikungunya-virus-infection#surveillance-and-reporting)).

Wildlife Health Australia administers Australia's general wildlife health surveillance system, in partnership with government and non-government agencies. Wildlife health data is collected into a national database, the electronic Wildlife Health Information System (eWHIS). Information is reported by a variety of sources including government agencies, zoo based wildlife hospitals, sentinel veterinary clinics, universities, wildlife rehabilitators, and a range of other organisations and individuals. Targeted surveillance data is also collected by WHA. See the WHA website for more information <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance> and <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance/eWHIS-Wildlife-Health-Information-System>.

## Acknowledgements

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*Wildlife Health Australia recognises the Traditional Custodians of Country throughout Australia. We respectfully acknowledge Aboriginal and Torres Strait Islander peoples' continuing connection to land, sea, wildlife and community. We pay our respects to them and their cultures, and to their Elders past and present.*

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