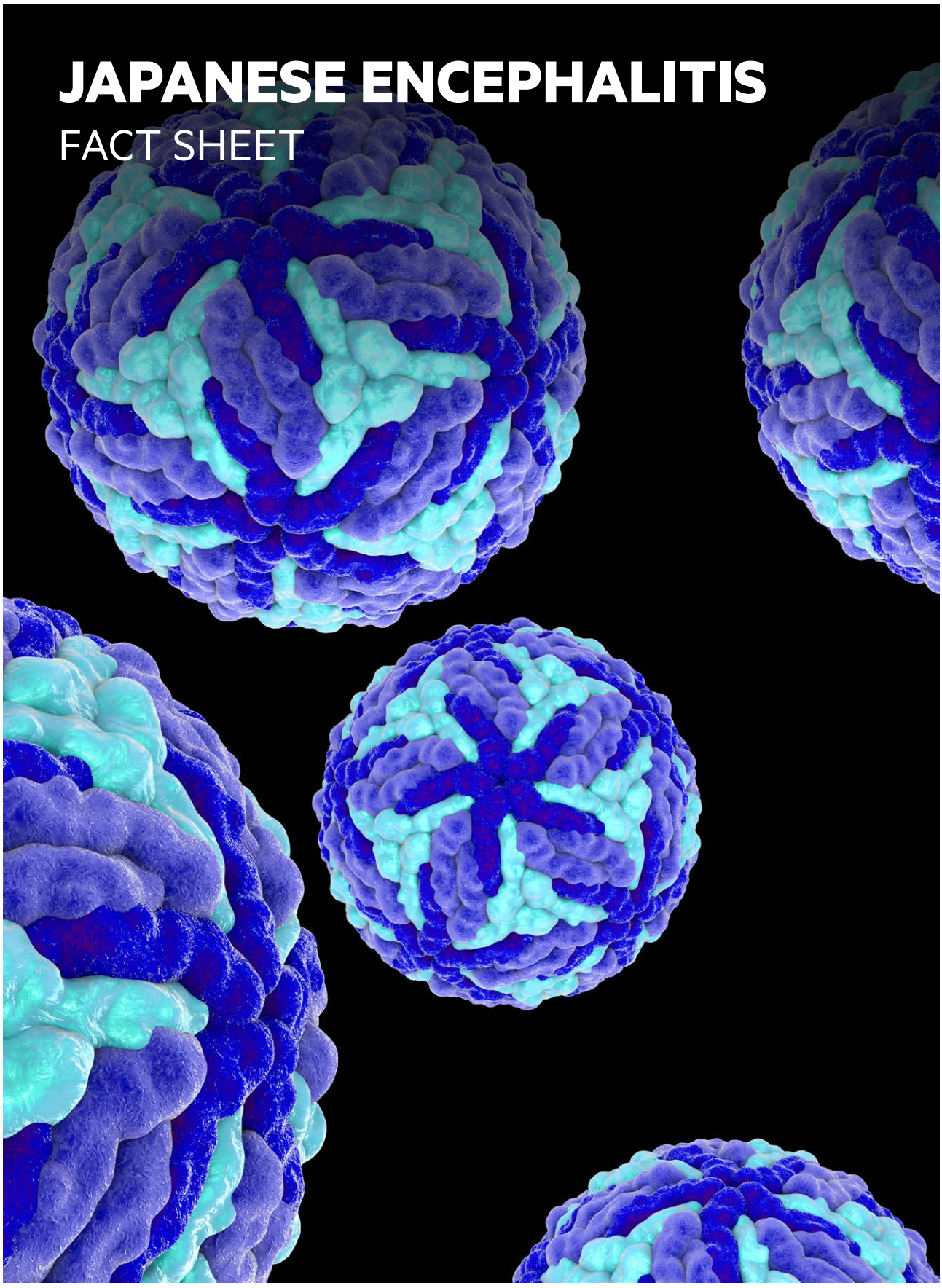
QUEENSLAND MUSEUM

JAPANESE ENCEPHALITIS

FACT SHEET



Q26-027

Queensland Government

WHAT IS JAPANESE ENCEPHALITIS?

Japanese encephalitis is a zoonotic disease caused by Japanese encephalitis virus (JEV), genus *Flavivirus*. *JEV* is an arbovirus, meaning it is transmitted by arthropods, in this case mosquitoes. Humans become infected when bitten by mosquito vectors carrying JEV.

Japanese encephalitis emerged in mainland Australia in 2022, affecting Victoria, New South Wales, Queensland and South Australia during a major mosquito-borne outbreak. Before 2022, all cases in Australia had been confined to the outer islands of the Torres Strait, Cape York, and the Tiwi Islands.

Natural hosts

JEV is multi-host. Natural hosts can be reservoir (also known as maintenance hosts), amplifying or dead-end hosts.

- Reservoir hosts contribute to viral spread via mosquitoes and need to be present for virus maintenance in an area (sustained source of virus). Primary reservoir hosts of JEV are wading birds (e.g. herons and egrets; family Ardeidae).
- Amplifying hosts contribute to viral spread via mosquitoes to other vertebrate hosts, including humans. The main amplifying hosts of JEV are pigs (domestic or feral), which may act as reservoirs in endemic areas. In areas where pigs are not present, wild birds might also play a role as amplifying hosts.
- Dead-end hosts become infected and may develop disease, but do not contribute to onwards spread via reinfection of mosquitoes. The main dead-end hosts for JEV are horses and humans. Other non-human animals, such as mammals (ruminants and rodents), reptiles and amphibians (which may become infected but rarely show signs of disease), are also likely to be dead-end hosts.



How is it spread?

JEV is spread from an animal host by the bite of an infected *Culex* mosquito (vector) to another vertebrate host, which may be a human. *Culex annulirostris* mosquitoes are the most likely primary vector in Australia. This mosquito is found throughout Australia and primarily breeds in places with standing water, such as freshwater wetlands, flooded paddocks, ditches, shallow wells and canoes.

Mosquitoes become infected when feeding on a viraemic reservoir host (wading birds and pigs). Humans are dead-end hosts and do not spread JEV. JEV cannot move from animal to human without a mosquito vector. Humans cannot get JEV by touching an infected animal or by eating animal products.

There is no evidence of JEV causing disease in native Australian wildlife.

Who is at risk?

- Vets and vet nurses, construction workers, farmers, agricultural workers, animal transport workers, landscapers, rangers, fisherman, field scientists and other people who perform outdoor work.
- People camping, fishing, hiking, gardening or exercising outside at dawn or dusk (when mosquitoes are most active) in high-incidence areas.
- People living near pig farms or wetlands, particularly in northern or south-eastern Australia during mosquito season.
- Those living in areas with recent JEV detections.

Outbreaks of Japanese encephalitis in humans generally coincide with peak mosquito activity in the warmer and wetter months, but may occur year-round in the tropical north.



What are the symptoms?

In animals

Pigs (feral and domestic) infected while pregnant may suffer:

- stillbirths
- weak newborn piglets
- reproductive losses.

In piglets up to 6 months old, symptoms include:

- tremors
- encephalitis
- seizures
- death.

Older piglets may suffer:

- wasting
- depression
- paresis.

Adult pigs may show no clinical signs of infection.

Waterbirds, a reservoir host, usually do not show clinical signs of disease, nor do other native Australian wildlife species.

Milder symptoms in horses include:

- fever
- lethargy
- lack of appetite
- jaundice.

More serious symptoms in horses include:

- lack of coordination
- difficulty swallowing
- impaired vision
- excitement.

In humans

Most human infections (over 99%) are asymptomatic. If you do get symptoms, they can appear 5–15 days after getting bitten by an infected mosquito.

Severe cases involve inflammation of the brain (encephalitis), which occurs in 1 in every 250 infected people. Among those who get a serious illness, some may have lifelong neurological complications or even die.

Symptoms may include:

- fever
- headache
- vomiting
- seizures
- tremors
- neck stiffness
- paralysis
- confusion
- coma.

⚠ JEV infection may be fatal or cause long-term neurological complications.

How can I prevent infection?

Highly effective vaccines are available and recommended under certain circumstances, such as for people living or working in high-risk areas, piggery workers, outdoor workers in affected regions and travellers to JEV-endemic countries.

ⓘ Vaccination is the best protection against JEV.

Other ways to reduce the risk of infection involve mosquito management and avoidance of mosquito bites.

Prevention measures include:

- Use insect repellents (DEET or picaridin).
- Install flyscreens.
- Wear a long-sleeved shirt and long pants outdoors.
- Avoid outdoor activity at peak mosquito times (dawn and dusk).
- Support public health mosquito-control programs.

Humans are dead-end hosts and do not spread JEV.

What treatments are available?

There is no specific treatment for Japanese encephalitis and management is supportive. Symptomatic patients often need hospitalisation, depending on their clinical signs.

If you think you may have been exposed to JEV, please contact your doctor or public health agency for further advice.

Cover: Computer illustration of Japanese encephalitis virus. Courtesy: Alamy/Science Photo Library
Page 2: White-faced heron. QM, Gary Cranitch
Page 3: A feral pig. QM, Gary Cranitch

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