

West Nile virus in Australia

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Animal Biosecurity and Welfare

Background

West Nile Virus (WNV) is a mosquito borne virus belonging to the genus *Flavivirus*. A strain of WNV, Kunjin virus (WNV_{KUN}) is endemic in parts of Australia and has been present for many years. Other *Flaviviruses* include Dengue, Japanese encephalitis, Murray Valley encephalitis and Zika viruses.

WNV is found across all continents except Antarctica. In Australia, WNV_{KUN} has been infrequently associated with disease in humans. In 2011, there was a large outbreak of neurological disease in horses in South East Australia caused by a variant of the Australian strain WNV_{KUN}. [1]

Signs of West Nile virus

In Australia, disease has been limited to horses, although several cases have been suspected (though not confirmed) in dogs and alpaca. Many animals infected with WNV do not develop any clinical signs. Unlike North American strains, Australian strains of WNV have not caused disease in birds.

The early stages of disease may be mistaken for colic. Initially horses may appear depressed and reluctant to move but these signs are soon followed by neurological signs. The most commonly encountered signs are those of ataxia (including stumbling, staggering, wobbly gait, or incoordination).

Other nervous signs may include:

- Facial paralysis
- Muscle tremors/fasciculation
- Hyperaesthesia
- Circling
- Blindness
- Recumbency or inability to stand
- Hind limb weakness
- Multiple limb paralysis
- Altered mental state
- Hypermetria

- Depression

Fever is an inconsistent finding, usually as a result of the late onset of neurological signs relative to the time of infection. It is important to differentiate the illness from Hendra virus infection particularly in areas where flying foxes are abundant and to take appropriate precautions.

The majority of affected horses recover uneventfully within a few days to a few weeks. In the 2011 WNV outbreak, about 10% of horses showing clinical signs died.

West Nile Virus infection is notifiable in NSW

You may notify infection by

- Phoning your [Local Land Services](#) on 1300 795 299,
- Notifying on-line at <http://www.dpi.nsw.gov.au/agriculture/live-stock/health/general/notifiable-animal-diseases-nsw/animal-disease-form>
- By fax (02 6361 9976) or email (biosecurity@dpi.nsw.gov.au) a completed NSW [notifiable animal disease form](#).

How is the virus spread?

WNV is maintained in a mosquito-bird cycle where mosquitoes act as vectors and birds act as natural hosts. The species of mosquito (*Culex annulirostris*) that most frequently spreads WNV breeds in fresh water. Wading birds are key natural reservoirs of WNV in Australia. Horses, people and a variety of other animals may become infected through a bite from an infected mosquito. There is no further spread of the virus from an infected mammal.

When does it occur?

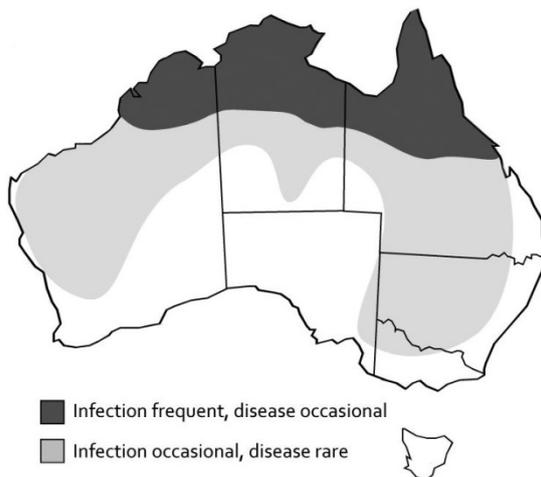
WNV infections are encountered intermittently in NSW.

The seasonal occurrence of WNV infection may vary depending on climatic conditions that influence the distributions of both the vector and the natural reservoirs. Virus transmission is more common after periods of very high rainfall in spring and early summer. However, infections in animals are more likely to be observed from February to April, sometimes when mosquito populations are not unusually high.

Where does it occur?

WNV is endemic in northern Australia. While *Culex annulirostris* is common throughout NSW, very large populations develop in the Murray Darling River basin and Macquarie Marshes areas of NSW. Asymptomatic infection occurs intermittently in these areas and can be detected serologically in sentinel chickens or other animals, particularly dogs and horses.

Figure 1. Known distribution of West Nile virus infection and disease caused by WNV [1]



In 2011, cases of disease in horses in NSW were initially detected in south western and central western NSW but became widely distributed west of the Great Dividing Range from northern NSW to the Murray River in the south and throughout the Hunter Valley and Sydney basin.

Diagnosis of West Nile Virus in Horses

Diagnosis of West Nile virus in live horses is routinely based on detecting an immune response to the virus. Collection of paired clotted blood samples is recommended. The first (acute) sample should be taken as soon as possible after clinical signs have been observed. A second

convalescent sample should be collected approximately 21 days later. The acute samples should be submitted to the laboratory soon after collection as a high proportion of horses will give significant results in the WNV IgM assay at the time clinical signs are first observed.

If cerebrospinal fluid (CSF) has been collected, it should also be submitted for testing for both the virus by qRT-PCR and for antibody detection. Although WNV can be detected in the central nervous system of acutely infected horses, it is not possible to detect viral RNA in blood samples.

If the horse dies or is euthanased, both fresh and fixed brain, CSF and upper cervical spinal cord samples should be taken. The brain should be cut in half longitudinally to ensure that representative areas are available fresh for virus detection and fixed for histopathology. The risk of Hendra virus infection should be considered prior to tissue collection.

Keep all samples chilled but do not freeze.

The Department of Primary Industries covers the cost of laboratory testing of samples collected by a veterinarian to confirm or exclude suspected WNV infection in animals.

For further information on submitting laboratory samples see: <http://www.dpi.nsw.gov.au/about-us/services/laboratory-services/sample-submission>.

Treatment

There is no specific treatment available for WNV infections. Supportive treatment with intravenous fluids and anti-inflammatory drugs may be required.

Prevention

Reducing exposure of horses to mosquitoes is the most effective measure to minimise the risk of infection with WNV. Mosquitoes are usually most active at dusk and dawn, so reducing time outside at these times may help. Insecticides and physical barriers, such as rugs for horse, may also be useful.

Further information

For further information regarding West Nile virus infection in animals visit [Wildlife Health Australia](#) (Fact sheets, various species of animals).

For further information regarding West Nile virus infection in people visit [NSW Health](#).

More information

Contact Paul Freeman, Senior Veterinary Officer,
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Acknowledgements

- Wildlife Health Australia
- NSW Health

For updates go to

<http://www.dpi.nsw.gov.au/about-us/publications/publications>

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (February 2017). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent advisor.

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Reference

1. Frost, M.J., et al., *Characterization of Virulent West Nile Virus Kunjin Strain, Australia, 2011*. *Emerging Infectious Diseases*, 2012. **18**(5): p. 792-800.