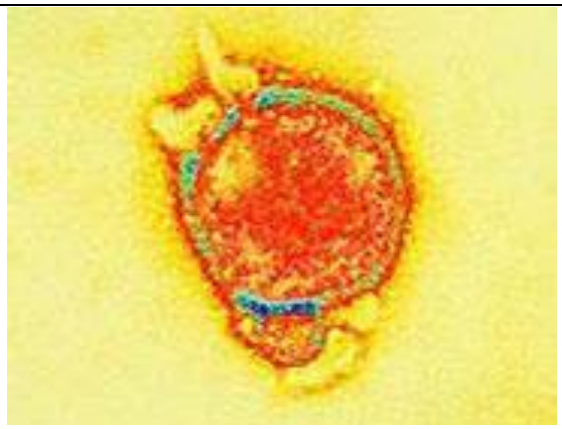
Hendra Virus

For the first time Australia, the lucky country, is faced with a deadly disease that is completely home grown, and so far, unique to our shores. The fact that this disease can be caught by and kill humans as well, just increases the fear and worry that we all feel. It's no good saying that it's a rare event, because the devastation that it brings has a huge impact on horse owners, carers and industry.

Hendra virus was first isolated in 1994 from an outbreak of disease in a racing stable located in the northern Brisbane suburb of Hendra less than 10km from the city centre. The outbreak resulted in death of a horse trainer and 13 horses and left a stable hand seriously ill. A further seven horses with evidence of exposure to the virus were humanely destroyed to avoid possible further spread of the disease. Since Hendra virus was first isolated, significant progress has been made in understanding the virus, where it originates in nature, and how to detect infection and past exposure. Shortly after the September 1994 outbreak, researchers isolated and characterised the virus, developed laboratory tests to detect infection in both humans and animals, and identified the likely source of the virus.
Hendra virus and its close relation Nipah virus, both belong to a separate category of the Paramyxoviridae family, the Henipaviruses. In addition to a number of unique molecular characteristics, these viruses are distinguished from other members of the family by their ability to infect a broad range of species and fatally infect both animals and humans.



Artificially coloured Hendra virus electron micrograph
Courtesy AAHL Biosecurity Microscopy Facility.

Nipah virus emerged in pigs and humans in Malaysia. Since then over 470 known human infections and over 240 deaths have been linked to outbreaks of Nipah in Malaysia, Singapore, Bangladesh and India. There have been no reported outbreaks in Australia.

So what does Hendra do – in very simple terms it attacks the cells so that they leak blood and fluids. Where it attacks in the body leads to the broad range of symptoms, in the lungs it leads to bleeding and effectively horses drown in their own fluids, in the brain they get neurological symptoms and die of encephalytis. Hendra cases have also exhibited anything from mild depression to colic – we can now say that there are no "classic" Hendra symptoms. All sick horses should be treated with caution.

Possible symptoms of Hendra Virus

- rapid onset of illness
- increased body temperature/fever
- increased heart rate
- discomfort/weight shifting between legs
- depression
- rapid deterioration

Respiratory signs that include:

- respiratory distress
- increased respiratory rates
- nasal discharge at death-can be initially clear progressing to stable white froth and/or stable blood-stained froth.

Neurological signs that include:

- aimless walking in a dazed state
- muscle twitching
- loss of balance, problems getting to feet
- loss of vision in one or both eyes
- head tilting, circling
- muscle twitching
- urinary incontinence
- facial swelling.

If you see these symptoms call your veterinarian or DPI&F 13 25 23 or Emergency Animal Disease 1800675888
Shower and change clothes if you have handled a sick horse
Stay away from other horses

If you have a horse that is suspected to have Hendra, do not move any other horses off the property until given the all clear.

Biosecurity must be carried out!
Hendra is quite hard to catch but it is one of the deadliest viruses known. At this stage there are no effective treatments.
Please read our fact sheets on Biosecurity and Hendra – Reducing the Risk

Horse with Hendra Virus - Biosecurity is Essential

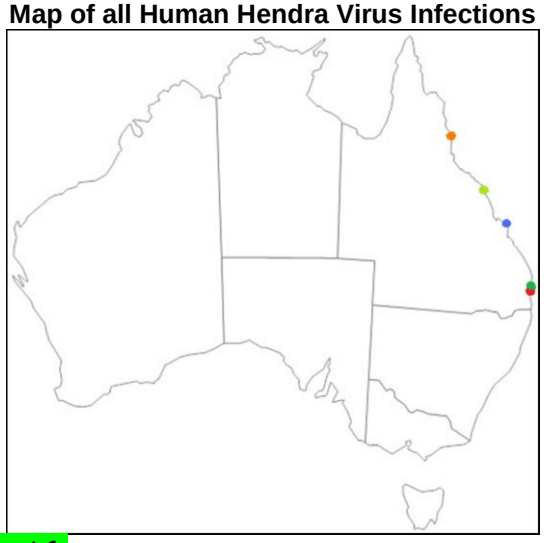
The following points when combined with the symptoms already listed could also support suspicion of HeV:

- Where there are multiple cases, a high case fatality rate occurs within 48 hours.
- Some cases have initially been reported as colic, or even depression – there are no "classic" Hendra symptoms.
- Bats in the area, though a lack of bat sightings does not rule out HeV.
- The horses live in or near paddocks that attract bats. These include trees with soft fruits, figs, stone fruits such as peaches, loquats, and mangos. High risk native trees include Moreton Bay Figs, Palms, Lilly Pillies, Eucalypts, Melalueca, Callistemon and Grevilleas.

Hendra virus is carried by flying foxes. Under unknown but rare circumstances, the virus spills over from these bats to susceptible horses, killing over 70% of the horses it infects. Under even rarer circumstances, the virus spreads to humans who have had very close contact with Hendra infected horses. While there is strong evidence to support this mode of transmission (bat-to-horse-to-human) there is no evidence of bat-to human or human-to-human. Human to horse transmission would only be possible in the case of biosecurity breaches, where people have transferred the virus on contaminated gear or clothing.

Though there have been significant gains in knowledge about Hendra, a great deal remains to be learnt. The incubation period (time from exposure to the appearance of the first clinical signs of infection) of Hendra virus in horses is five to 16 days. Fatally infected horses died on average two days after the first sign of infection. While approximately 25% of horses are thought to survive acute infection, the current national policy requires these horses to be euthanased. The incubation period in humans is believed to be five to 14 days, and the current human case fatality rate is more than 50%.

Map of all Human Hendra Virus Infections



Incident 1:
Mackay, August 1994. Not recognised until the death of the farmer who had assisted his veterinarian wife with an autopsy of two horses that died of unknown causes. The farmer appeared fully recovered after hospitalisation but relapsed and died 13 months later. Retrospective testing showed the horses were infected with Hendra.

Incident 2:
Hendra, September 1994. Resulted in the death of a horse trainer, 13 of his horses, and caused severe febrile illness in a stable-hand. The trainer had very close physical contact sick horses, as did the stable hand.

Incident 3:
Gordonvale, October 2004. A veterinarian tested positive for Hendra virus after performing a post mortem on a horse that died suddenly. While no samples were available from the horse for testing, the clinical and post mortem signs were consistent with Hendra virus infection.

Incident 4:
Redlands, June 2008. A veterinarian and veterinary nurse at the Redlands Veterinary Clinic were infected after close direct contact with infected horses. The veterinarian tested positive for Hendra virus and died in August after spending several weeks in intensive care. The veterinary nurse also spent several weeks in intensive care but was later discharged.

Incident 5:
Cawarral, August 2009. A Queensland veterinarian died in September after being exposed to Hendra. Infection has been confirmed in two horses that died and another had to be destroyed after returning a positive test. The incident was discovered after a property manager and a local veterinarian alerted Biosecurity Queensland with the death of a horse suffering from respiratory distress.

Since 1994 there have been 46 horse (known) and 4 human deaths directly related to Hendra virus infections.

The detection of viral genetic material in the blood, nasal secretions and a wide range of body tissues of infected horses indicates that by the time a horse shows clinical signs of infection the virus is widespread throughout the body. Most virus is shed from these horses when they are sickest, suggesting that this is the most likely time for transmission to humans. However, studies have also shown that a horse can potentially excrete the virus through nasal/naso-pharyngeal secretions at least two days prior to the appearance of clinical signs.

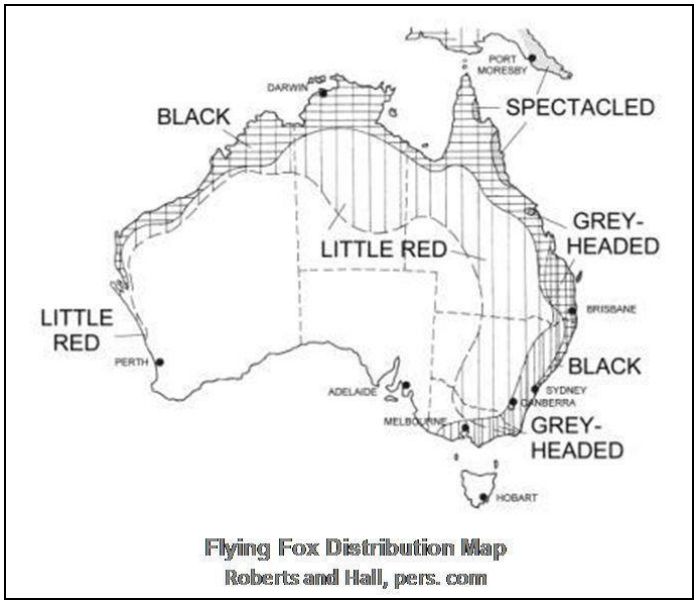
Table of ALL known incidents of Hendra Virus

1994	August	Mackay	QLD
1994	September	Hendra	QLD
1999	January	Trinity Beach	QLD
2004	October	Gordonvale	QLD
2004	December	Townsville	QLD
2006	June	Peachester	QLD
2006	October	Murwillumbah	NSW
2007	June	Peachester	QLD
2007	July	Clifton Beach	QLD
2008	July	Redlands	QLD
2008	July	Proserpine	QLD
2009	August	Cawarral	QLD
2009	September	Bowen	QLD
2010	May	Tewantin	QLD

The exact mechanics of Hendra virus transmission from flying foxes to horses is not known. However transmission is thought to be through the ingestion of grass, feed or partially eaten fruit contaminated with bat urine, saliva or other bodily fluids. It does not appear to involve other domestic animals or wildlife. Horse-to-horse transmission of the virus is likely, as a proportion of incidents involved infection of both the index case and companion horses. In these incidents, transmission of the virus appears to have been more efficient in horses housed in stables or stalls, but it is also possible that companion horses were infected as a result of separate bat-to-horse transmission.

The migratory and feeding areas of flying foxes

Diversity and distribution of flying foxes in Australia are two other factors which may contribute to transmission of the virus from bats-to-horses. The large numbers of little red flying fox populations in Australia have an extensive distribution that overlaps geographically with all known Hendra incident locations. While it is possible that wherever flying foxes and horses are found in close proximity there may be a risk of bat-to-horse transmission, the geographical range of flying foxes with proximity to horses is much broader in north eastern Australia. This suggests that Hendra virus infection in flying foxes, and/or the risk of spill over to horses, may be related to the type or mix of flying foxes in this region. The timing of Hendra virus infection in horses may be linked to the pattern of pulsing infection in flying foxes. A period of the peak virus excretion may follow the introduction of infection to a susceptible bat colony. This period is likely to correspond to increased risk of infection of susceptible horses in the vicinity.



Despite the recent emergence of Hendra virus and the difficulties associated with researching a virus carried by flying foxes, there have been significant advances in understanding this virus and the disease it causes. The virus has been fully characterised and monitoring sequence changes in isolates is ongoing. The species that are susceptible to infection have been determined and how the virus infects the cells of these species (and the symptoms it causes) has been well documented. A suite of laboratory tests have been developed for detection of the virus during incidents and for surveillance, and these tests can now be performed in a number of national and international laboratories. And the analysis of experimental infections continues, yielding new data to be used to improve management of the disease. Hendra virus research, however, is challenging, complicated and much remains to be learnt.