

Nipah Virus



What is Nipah Virus?

Nipah Virus (NiV) is an emerging infectious disease which first appeared in domestic pigs in Malaysia and Singapore in 1998 and 1999.

There is evidence of Nipah infection among several species of domestic animals including dogs, cats, goats, and horses. Sheep may also be affected. However, since the initial outbreak it has primarily affected humans in different parts of the world.

The disease causes respiratory and occasionally nervous signs in pigs. It has devastating zoonotic potential.

The organism which causes Nipah Virus encephalitis is an RNA virus of the family *Paramyxoviridae*, genus *Henipavirus*, and is closely related to Hendra virus. Hendra virus, formerly known as equine morbillivirus pneumonia or acute equine respiratory syndrome, is an acute, viral respiratory infection of horses and humans that has been reported in Australia.

Nipah Virus infection, also known as Nipah Virus encephalitis, was first isolated and described in 1999. The name, Nipah, is derived from the village in Malaysia where the person from whom the virus was first isolated succumbed to the disease.

Nipah Virus is a disease listed in the World Organisation for Animal Health (OIE) *Terrestrial Animal Health Code* and must be reported to the OIE (OIE *Terrestrial Animal Health Code*). Hendra virus is not yet an OIE listed reportable disease.



Where is the disease found?

There have been Nipah Virus infection outbreaks in pigs Malaysia and Singapore, and human disease in Malaysia, Singapore, India, and Bangladesh. Evidence of the virus without clinical disease has also been found in fruit bats in Cambodia, Thailand and Madagascar.

How is Nipah transmitted and spread?

Fruit bats, also known as 'flying foxes,' of the genus *Pteropus* are natural reservoir hosts of the Nipah and Hendra viruses. The virus is present in bat urine and potentially, bat feces, saliva, and birthing fluids. Perhaps as a result of deforestation programmes, the Malaysian pig farms where the disease first originated had fruit trees which attracted the bats from the tropical forest, thus exposing domestic pigs to bat urine and feces. It is thought that these excretions and secretions initiated the infection in pigs which was then followed by a rapid spread through intensively reared pigs. Furthermore, transmission between farms may be due to fomites – or carrying the virus on clothing, equipment, boots, vehicles, etc.

What is the public health risk associated with this disease?

Nipah Virus is a zoonotic disease. Transmission to humans in Malaysia and Singapore has almost always been from direct, contact with the excretions or secretions of infected pigs. Reports from outbreaks in Bangladesh suggest transmission from bats without an intermediate host by drinking raw palm sap contaminated with bat excrement, or climbing trees coated in bat excrement.

In Bangladesh and India, there have been reports of possible human-to-human transmission of the disease so precautions are necessary for hospital workers caring for infected patients. Precautions should also be taken when submitting and handling laboratory samples, as well as in slaughterhouses.

Typically the human infection presents as an encephalitic syndrome marked by fever, headache, drowsiness, disorientation, mental confusion, coma, and potentially death. During the outbreak in Malaysia, up to 50% of clinically apparent human cases died. There is no specific treatment for Nipah Virus. Supportive care is the general treatment for this disease.



What are the clinical signs of Nipah Virus?

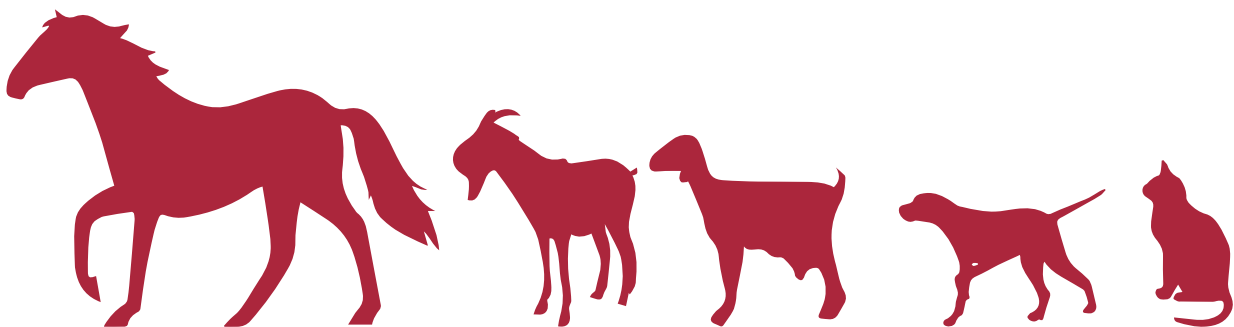
Nipah Virus in pigs affects the respiratory and nervous systems. It is known as porcine respiratory and neurologic syndrome, porcine respiratory and encephalitic syndrome (PRES), and barking pig syndrome (BPS). It is a highly contagious disease in pigs; however the clinical signs vary depending on the age and the individual animal's response to the virus. In general, mortality (death due to the disease) is low except in piglets. However, morbidity (illness from the disease) is high in all age groups.

Most pigs develop a febrile respiratory disease with a severe cough and difficulty breathing. While the respiratory signs predominate, encephalitis has been described, particularly in sows and boars, with nervous signs including twitching, trembling, muscle fasciculation, spasms, muscle weakness, convulsions, and death. Some animals, however, remain asymptomatic.

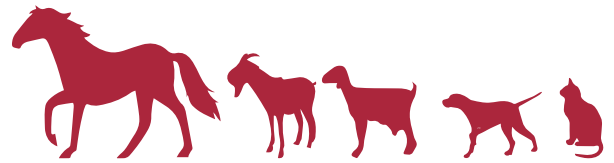
Natural infection of dogs with NiV causes a distemper-like syndrome with a high mortality (death) rate.

How is the disease diagnosed?

The disease is difficult to diagnose based on clinical signs alone, however confirmation can be made through prescribed laboratory tests (OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*).



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What is being done to prevent or control this disease?

Prevention and control measures focus on immediate eradication by mass culling of infected and in-contact pigs and on antibody surveillance of high risk farms to prevent future outbreaks.

After culling, the burial sites are disinfected with chlorinated lime. It is also recommended to use sodium hypochlorite (bleach) to disinfect the contaminated areas and equipment. Other important control measures have been a ban on transporting pigs within the countries affected, a temporary ban on pig production in the regions affected, as well as improvement of biosecurity practices. Education and use of personal protective equipment (PPE) by persons exposed to potentially infected pigs is highly recommended. Also, improved hygiene at pig operations is suggested.

One of the most important biosecurity measures for affected areas is to decrease the likelihood of the bat reservoir coming into contact with pig production facilities.

Research into development of vaccines has been ongoing in Australia and France.



More Information?



References:

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Key Facts

- Many of the original human cases of the Nipah Virus disease were provisionally diagnosed as Japanese encephalitis (JE) before the isolation and identification of the newly discovered Nipah Virus.
- Perhaps as a result of deforestation programmes, many of the Malaysian farms first affected had fruit trees close to where the pigs were housed which attracted the bats and ultimately increased the exposure of the pigs to bat excretions containing the virus.
- In the 1998-1999 outbreaks of Malaysia and Singapore, over 1 million pigs were destroyed to control the disease, causing devastating economic and social consequences.
- Human cases occurred in Bangladesh and India in 2003, 2004, 2007, 2008 without apparent related domestic animal outbreaks.

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