

# Nipah virus

Nipah virus disease is an infectious zoonotic disease caused by Nipah viruses (NiV) which first appeared in domestic pigs in Malaysia and Singapore in 1998 and 1999, when over 1 million pigs were destroyed to control the disease. This disease causes respiratory and occasionally nervous signs in susceptible animals such as pigs and horses and could have devastating zoonotic potential.

There have been NiV outbreaks in humans and animals in some countries in Asia. For more recent, detailed information on the occurrence of this disease in animals worldwide, see [World Animal Health Information System Interface](#). For more recent, detailed information on the occurrence of this disease in humans, see the [WHO Emergency Dashboard](#).

## Links to Code and Manual

Terrestrial manual



## What is Nipah virus disease?

Nipah virus disease is an infectious disease which first appeared in domestic pigs in Malaysia and Singapore in 1998 and 1999. The name, Nipah, originated from the name of the village in Malaysia where pig farmers became infected<sup>1</sup>. The organism which causes Nipah virus disease is an RNA virus of the family *Paramyxoviridae*, genus *Henipavirus*, and is closely related to Hendra virus that causes acute respiratory infection of horses and humans.

There is evidence that Nipah virus can infect several species of domestic animals including pigs, horses, dogs and cats<sup>2</sup>. The disease causes respiratory and occasionally nervous clinical signs in pigs. In the initial outbreaks in Malaysia and Singapore in the 1990s, humans became infected with NiV through close contact with infected pigs. However, since then, most instances of NiV in humans have either occurred through contact with other infected individuals or via exposure to infected bats. Nipah virus infection in humans causes a range of clinical presentations, from asymptomatic infection to acute respiratory signs and fatal encephalitis.

Infection with Nipah Virus is listed in the World Organisation for Animal Health (WOAH) *Terrestrial Animal Health Code* and must be notified to WOAH.

## Transmission and spread

Fruit bats, also known as 'flying foxes', are natural reservoir hosts of Nipah virus<sup>3</sup>. The virus is present in bat urine and potentially, bat faeces, saliva, and birthing fluids. During the outbreaks in 1998–1999 in Malaysia, bats were implicated in the introduction of the virus to pig herds, potentially through the ingestion of food and water contaminated with bat waste by the pigs. Within pig farms, infection can spread between pigs through direct contact, as well as to other pig farms through carriage of the virus on fomites (carrying the virus on clothing, equipment, boots, vehicles...).

## Public health risk

Nipah virus is a zoonotic disease with a high case fatality rate in humans (40%–75%). In the outbreaks of 1998–1999 in Malaysia and Singapore, transmission to humans has almost always been from direct contact with the excretions or secretions of infected pigs. Since then, reports from outbreaks, notably in Bangladesh and India, suggest transmission from bats without an intermediate host by consuming food contaminated with bat secretions for example raw palm sap or fruits<sup>6</sup> and climbing trees contaminated with bat excrement<sup>7</sup>.

In 2014, there was a reported outbreak of NiV in humans in the Philippines that was attributed to direct contact with contaminated fluids during the slaughter of infected horses and consumption of undercooked meat<sup>4</sup>. There have been recent reports of NiV cases in humans, associated with close and prolonged contact with an infected individual. Therefore, precautions are necessary for people caring for infected patients. Precautions should also be taken when submitting and handling laboratory samples from suspected cases as well as for those working in close association with susceptible animals and slaughterhouses from at-risk areas.

Over the past two decades, the epidemiology of NiV infection has evolved. Recent NiV cases are predominantly associated with human-to-human and bat-to-human transmission, with domestic animals playing a lesser role in transmission. For information about Nipah virus disease in humans and measures to prevent infection, please refer to the [World Health Organization](#).

## Clinical signs in animals

Nipah virus causes a highly contagious disease in pigs that affects the respiratory and nervous systems. It is known as porcine respiratory and neurologic syndrome, porcine respiratory and encephalitic syndrome (PRES) or barking pig syndrome (BPS)<sup>8</sup>. The clinical signs in pigs 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, do not show clinical signs.

During the 2014 outbreak in the Philippines, horses were reported to have developed acute, fatal neurological signs or died suddenly with no apparent preceding illness<sup>4</sup>.

## Diagnostic

Nipah virus is difficult to diagnose based on clinical signs alone, however, confirmation can be made through the prescribed laboratory tests in the [WOAH Manual of Diagnostic Tests and Vaccines for Terrestrial Animals](#).

## Prevention and control

Good biosecurity is key to preventing infection in domestic animals. One of the most important biosecurity measures for affected areas is to decrease the likelihood of the bat reservoir coming into contact with susceptible animals. In infected areas, pigs and horses should be kept away from fruit tree plantations, and fruits that may have been in contact with bats should not be fed to animals.

Veterinarians and animal keepers should maintain vigilance, and suspected or confirmed cases should be reported to the Veterinary Authorities. As there is no specific treatment or vaccine against NiV, eradication relies on the early detection and destruction of infected and at-risk animals. It is important for burial sites of infected animals to be disinfected with chlorinated lime<sup>9</sup>.

Measures to protect humans from infection include reducing contact with bats and secretions such as thorough handwashing after handling fruits and preparing these items, and ensuring the use of covered containers when collecting palm sap, followed by boiling before consumption<sup>10</sup>. Education and use of personal protective equipment (PPE) by persons in contact with potentially infected animals is highly recommended.

<sup>1</sup>Centers for Disease Control and Prevention (CDC). Outbreak of Hendra-like virus-Malaysia and Singapore, 1998-1999. *Morb Mortal Wkly Rep*. 1999;48(13):265-269.

<sup>2</sup>Ang BS, Lim CHL, Jeong L, Nipah Virus. *J Clin Microbiol*. 2010;48(12):4197-417. doi:10.1128/JCM.01675-10

<sup>3</sup>Calisher CH, Tsalik EL, Nipah Virus. *J Clin Microbiol*. 2010;48(12):4197-417. doi:10.1128/JCM.01675-10

<sup>4</sup>Cheng PKG, de los Reyes VC, Sucaldito MN, et al. Outbreak of Nipahvirus Infection, Philippines, 2014. *Emerg Infect Dis*. 2015;21(2):328-331. doi:10.3201/eid2102.141433

<sup>5</sup>Epstein JH, Arthur SG, Islam A, et al. Nipah virus dynamics in bats and implications for spillover to humans. *Proc Natl Acad Sci U S A*. 2010;107(20):9190-9195. doi:10.1073/pnas.2000429107

<sup>6</sup>Information for General Public: Ministry of Health and Family Welfare. Accessed September 22, 2023.

<sup>7</sup><https://ncdc.mohfw.gov.in/showfile.php?id=230>

<sup>8</sup>Nipah virus infection – Bangladesh. Accessed September 22, 2023. <https://www.who.int/emergencies/diseases/nipah-virus/item/2003-D01442>

<sup>9</sup><https://www.msdsmanual.com/generalized-conditions/nipah-virus-infection/nipah-virus-infection-in-swine>

<sup>10</sup>Spirkler AR. Nipah Virus Infection. Center for food safety and public health: 2016.

<sup>11</sup>Seven things you need to know about Nipah virus | Gavi, the Vaccine Alliance. Accessed September 22, 2023.

<sup>12</sup><https://www.gavi.org/vaccineswork/seven-things-you-need-know-about-nipah-virus>

## Newsletter

The monthly newsletter that relays news and regions. News includes Member self-declarations, articles, upcoming events, publications, communication tools and more. Activities at both global and regional levels.

Subscribe

World Organisation for Animal Health

Regions

Africa

Asia and the Pacific

Europe

Middle East

WOAH

Contact

Career

Procurement

Follow us

