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How to better report on the interconnections between humans, animals & the environment



REPORTING ON THE

# NIPAH VIRUS



Nipah virus disease is a zoonotic disease of public health importance mainly in countries of South East Asia and the Western Pacific, where Pteropus fruit bats, the natural host of the virus, are widespread. Without detection and control, the disease can quickly claim lives considering its high [case fatality rate](#) of 40% to 75%, and because there is as yet neither a vaccine nor treatment. In 2018, the World Health Organization listed Nipah virus (NiV) as one of the ten most important microbes to monitor and to prepare countermeasures to prevent a pandemic.

Four years later, as the world reels from the devastating impacts of the COVID-19 pandemic, the WHO has launched [an independent expert-led global exercise](#) to update the list of priority pathogens—agents that can cause outbreaks or pandemics—to guide global investment, research and development (R&D), especially for vaccines, tests and treatments. Watch for WHO's announcement in the first half of 2023, to see which viruses and bacteria have made it to the priority list!

NEWS  
ALERT

Here are some simple tools to help you cover the Nipah virus story:

1

**Educate audiences about the activities that place humans in the path of a likely animal to human spillover**

The transmission of pathogens from animals to humans is called a zoonotic spillover. Nipah virus, a paramyxovirus whose wildlife reservoir is Pteropus bats, was first discovered in a large outbreak of acute encephalitis in Malaysia in 1998 among persons who had contact with sick pigs. Its name originated from Sungai Nipah, a village in the Malaysian Peninsula where pig farmers became ill with encephalitis.

It is probable that initial transmission of NiV from bats to pigs occurred in late 1997/early 1998 through contamination of pig swill by bat excretions, as a result of migration of these forest fruit bats to cultivated orchards and pig-farms, driven by the [failure of forest trees to bear fruits during the El Nino-related drought and human-caused forest fires in Indonesia](#) in 1997-1998.



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Apparently, one or more pigs was infected from bats, and the virus then spread efficiently between pigs, then from pigs to people.

In Malaysia, NiV transmission to humans has occurred through close contact with infected pigs. Scientists were able to confirm this with the finding that the NiV isolated from the pigs in the southern regions of the country had [gene sequences](#) identical to those of humans. A clear link has been established between [infection and the activities](#) related to pig breeding, e.g., drug application, insemination, or disposal of dead animals. As in Malaysia, cases of NiV infection in Singapore resulted from direct contact with pigs or their feces and involved [slaughterhouse workers](#).

In Bangladesh and India, the involvement of pigs in the transmission of the virus to humans and the impact of these animals on the scale of infection have not been observed.

When assessing the degree of risk resulting from contact with pigs, journalists must also consider the method of breeding them in each region. In Malaysia pigs are kept in large pigsties. Whereas in Bangladesh, which is a Muslim country, the scale of their production is limited, and small herds are usually kept by one person. This limits the possibility of virus transmission both between animals and from animals to humans. Also in India, pig breeding is carried out on a smaller scale than in Malaysia.



In Bangladesh, drinking raw date palm sap is the most common form of transmission of infection from bats to humans. Outbreaks coincide with sap harvesting season (December-May). Pteropus bats have been found to visit date palm trees and lick the sap streams being used for collection. Bats may also contaminate the sap collection pots with urine or feces.

Person- to- person spread is an important mode of transmission in Bangladesh and has been identified in all outbreaks. Other possible pathways include living under a bat roost, where bat urine may infect surroundings. Consumption of bat bitten fruit has also been suspected of being a potential mode of transmission.

During the 2018 outbreak in India, bats were screened with 19 % appearing positive for NiV and 33 % of the screened bats were positive during the outbreak in 2019. The 2021 outbreak, which started in September, again occurred in the district Kozhikode of Kerala. This resulted in the death of a boy who reportedly ate a bat bitten fruit.





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All Indian outbreaks have seen person-to-person transmission. Nipah virus infection has also been found among hospital workers. NiV [transmission originating from a hospital](#) was reported during the outbreak in Siliguri, India. Detection of NiV RNA on a hospital surface indicates that infected patients are transmitting the virus into an environment that could provide an opportunity for NiV transmission to hospital staff. The lifetime of NiV on the surface is not known exactly.

To assess the risk of Nipah virus disease for their media audiences, and better inform them on measures they can take to reduce exposure to the virus to prevent infection, journalists need to look at the following factors to understand how the NiV transmits from bats to humans and in the process replicates itself:

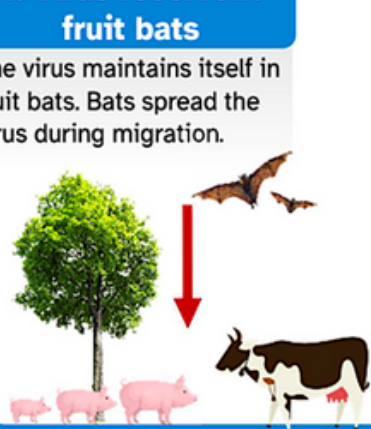


World Health Organization

## Nipah virus disease transmission

### 1. Virus reservoir: fruit bats

The virus maintains itself in fruit bats. Bats spread the virus during migration.



### 2. Epizootics and Palm sap

- Infected fruit bats enter in direct or indirect contact with other animals or date palm sap and pass on the infection.
- Could cause large-scale epidemics in pig farms (Malaysia 1999).
- Palm sap consumption (Bangladesh)

### 3. Primary human transmission

- Humans are infected either through:
- handling infected dead or sick domestic animals;
  - Consumption of date palm sap
  - or through direct contact with infected bats (rare event).

### 4. Secondary human transmission

- Secondary human-to-human transmission occurs through direct contact with the blood, secretions, or other body fluids of infected persons.
- High transmission risk when providing direct patient care.

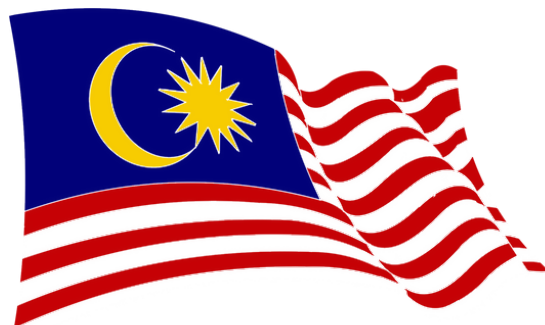
10% Health Care Workers

## REPORTING ON THE NIPAH VIRUS

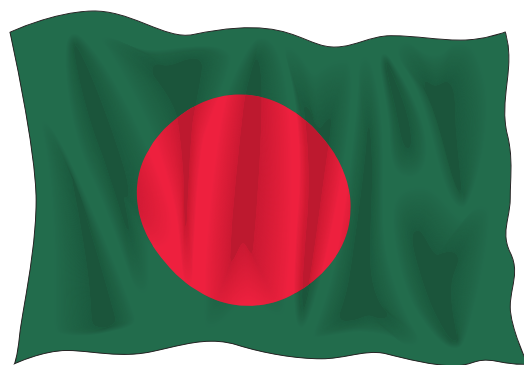
**2**

### Draw attention to the ways in which Nipah outbreaks can hit small-economies and workers

The Nipah virus outbreak in Malaysia (September 1998 to May 1999) resulted in 265 cases of acute encephalitis with 105 deaths, and near collapse of the billion-dollar pig-farming industry. As part of that outbreak, 11 abattoir workers in neighboring Singapore became ill following contact with imported pigs from Malaysia.



Recurring NiV outbreaks have been reported annually in different parts of Bangladesh from 2001, where the infection occurred due to the consumption of raw date palm sap contaminated with saliva and excreta of the bats. Reported cases ranged from zero (in 2002, 2006 and 2016) to 67 (in 2004). A lower number of reported cases was observed from 2016 following an extensive advocacy campaign against the consumption of raw date palm sap.



However, between 4 January to 13 February 2023, a total of 11 (ten confirmed and one probable) cases of Nipah virus infection including eight deaths were reported from seven districts across two divisions in Bangladesh. This is the highest number of cases since 2015 when 15 cases including 11 deaths were reported.

In India, the first outbreak occurred in Siliguri, West Bengal in 2001 with mostly person-to-person close contact, and in 2007, a repeated outbreak was reported in Nadia in West Bengal. Following the 2018 NiV outbreak in the Kozhikode district of Kerala, India that claimed 17 lives, there has been a recent re-emergence of the virus in the same district, causing the reported death of a 12-year-old boy in September 2021.





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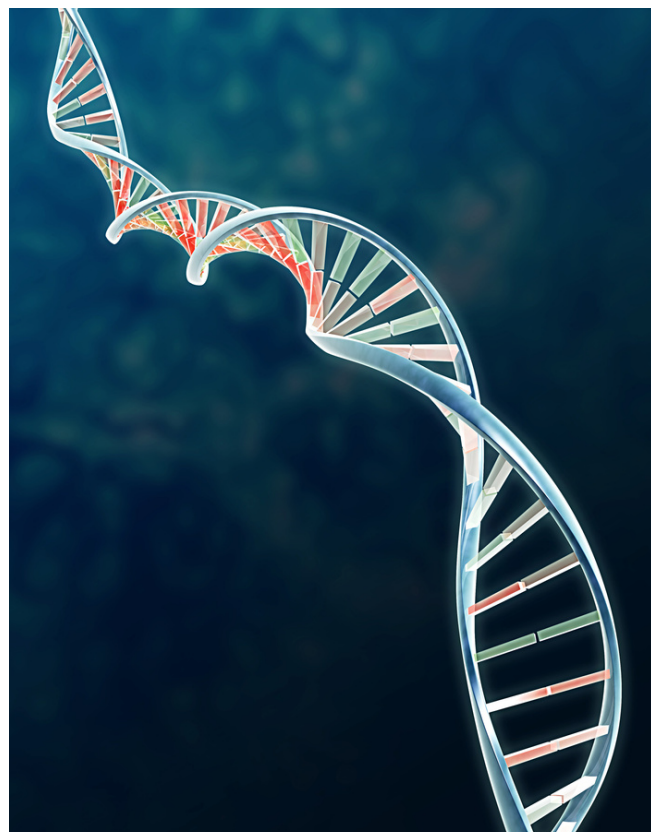


### 3 Track Nipah virus surveillance in your country

It is of interest for audiences to know where NiV is circulating. To date, NiV spillovers to human communities have been identified most commonly in rural communities in Bangladesh and India. The natural reservoir for NiV is fruit bats of the Pteropus genus; these bats have a wide geographic range that stretches across much of the Western Pacific region, South-East and South Asia and Madagascar.

Evidence also suggests that other fruit bats of the Pteropodidae family may harbour NiV; such bats can be found across Africa and parts of the Middle East. This [broad host range](#) increases the likelihood of additional spillover events from bats to humans, or livestock, in new areas where the disease has not yet been detected.

**Genomic sequencing** shows that there are multiple strains of NiV; for example, the strain responsible for the outbreak in Malaysia is different from those identified in Bangladesh and India.



### 4 Help audiences recognize the signs and symptoms of NiV disease

Initial signs and symptoms of Nipah virus infection are nonspecific, and the disease is often not suspected when the infected person seeks medical care. This can hinder accurate diagnosis and creates challenges in outbreak detection, effective and timely infection control measures, and outbreak response activities.

Human infections range from asymptomatic infection to acute respiratory infection (mild, severe), and fatal encephalitis. Share the following signs and symptoms of NiV disease, from the [WHO](#):

- Infected people initially develop symptoms including fever, headaches, myalgia (muscle pain), vomiting and sore throat. This can be followed by dizziness, drowsiness, altered consciousness, and neurological signs that indicate acute encephalitis. Some people can also experience atypical pneumonia and severe respiratory problems, including acute respiratory distress. Encephalitis and seizures occur in severe cases, progressing to coma within 24 to 48 hours.

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- The incubation period (interval from infection to the onset of symptoms) is believed to range from 4 to 14 days. However, an incubation period as long as 45 days has been reported.
- Most people who survive acute encephalitis make a full recovery, but long-term neurologic conditions have been reported in survivors. Approximately 20% of patients are left with residual neurological consequences such as seizure disorder and personality changes. A small number of people who recover subsequently relapse or develop delayed onset encephalitis.
- The case fatality rate is estimated at 40% to 75%.

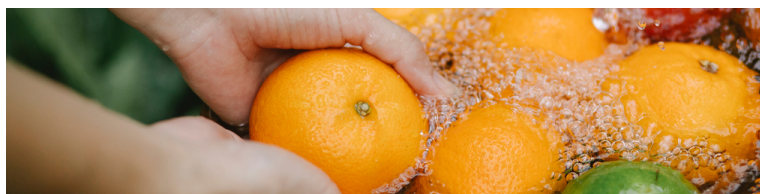
There are currently no drugs or vaccines specific for Nipah virus infection. Intensive supportive care is recommended to treat severe respiratory and neurologic complications.



### 5 Educate media audiences about how to protect themselves against NiV infections

As treatment options are limited, focus on NiV management should be on prevention. In reducing the risk of NiV bats-to-human transmission, the following key messages sourced to the [WHO](http://www.who.int) can be published as text boxes in stories:

- Protect the collection process of date palm juice using bamboo, jute sticks and polythene skirts to cover the sap producing areas of a tree effectively to prevent bat-sap contact. Community interventions should promote applying these skirts to prevent occasional Nipah virus spillovers to humans.
- Wash and peel fruits thoroughly.
- Boil freshly collected palm juice.
- Discard fruits with signs of bat bites.



### To control bat-to-animal transmission:

- Routine cleaning and disinfection of domestic animal farm is expected to be effective in preventing infection.
- To the risk of bat-to-domestic animal transmission, bat proof buildings, and avoid planting fruits trees in the animal farm.
- In endemic areas, when establishing new pig farms, considerations should be given to presence of fruit bats in the area and in general, pig feed and pig shed should be protected against bats when feasible.



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### To reduce the risk of domestic animal-to-human transmission:

- Avoid or minimize contact with ill or dead domestic animals.
- Hand hygiene + use of personal protective equipment (PPE) during veterinary practices (care, necropsies).
- When an outbreak in domestic animals is suspected: quarantine animal; premises; euthanize or cull infected animal(s); restrict/ban animal movements.

### To reduce the risk of human-to-human transmission:

- Avoid or minimize physical contact with ill patient.
- Encourage early treatment in Nipah virus disease Treatment Center.
- Wash hands regularly with soap and water.
- Use gloves and mask and practice hand-hygiene when caring for suspected Nipah patient at home.
- Health care workers should practice hand hygiene + use of personal protective equipment (PPE).

## 6

### Adopt a One Health approach when covering NiV stories

The One Health initiative is a growing movement to promote collaboration between the fields of medicine, veterinary medicine, social sciences, and environmental sciences to improve the interconnected health of people, animals, and ecosystems. The importance of such an approach is particularly obvious in the field of infectious disease, as [75% of all emerging infectious diseases are zoonotic](#). To better explain NiV infections to their media audiences, it is important for journalists to emphasize the One Health approach. Interactions between humans, animals, and the environment are key factors behind NiV outbreaks. Your stories could focus on the following interconnections:



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### Deforestation and climate change

Nipah virus has existed in the bats for centuries and research shows that this virus has [not undergone an evolutionary change](#), so why has the virus emerged as a threat to public health? A reason could be greater exposure to the virus because of increased human-animal contact. When covering NiV outbreaks, journalists should also investigate deforestation trends in the area as well as droughts caused by climate change, both understood as being strong drivers of infectious disease transmission.

For example, in Malaysia the virus spread due to unplanned deforestation of pulp wood, which is the natural habitat for NiV carrying bats. Malaysia has lost 14.4% of its forest cover from 2000-2012, it has lost 4.5 million hectares of its dense forest at the [rate of a football pitch every 1.5 minutes](#).

In Bangladesh the [forest cover has gone from 14% to 7% from 1989 to 2006](#) with most deforestation taking place in the Nipah belt region. These areas are high in terms of population density and low in terms of forest density, whereas the bat population is the same as the areas outside of the Nipah belt. What this means is that the bats have less trees to nest on as people move into the once-forested areas coming in closer contact with the bats.

In Malaysia in 1997-1998, a severe drought played an important role in fruit bat migration into the villages. Flying foxes are [very sensitive to temperature variation](#) and live only within a certain temperature range, even slight changes in the weather can disturb all the bat colonies of a particular region. This migration could have then led to the large scale spread of NiV among the piggeries in 1998 and subsequently among humans in 1999.

In Bangladesh, floods and sea level rise has also led to the migration of the bats further into villages. The frequency of flooding has been on a rise and there have been 8 major floods between 1974 and 2004, these include those that are expected to [occur only once in every 20 years](#).





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### Human-bat interaction

The increase in the human-bat interaction could be one reason why NiV outbreaks occurred in Bangladesh and India where humans got this virus from drinking date palm juice contaminated by bat urine or saliva.

Date palm sap is a popular delicacy in Bangladesh which is harvested by making a cut in the palm trunk and collecting sap which streams down into a clay pot held below the cut. This drink is usually sold raw and is a favorite among the children. It is also fermented into alcoholic drinks (toddy, tari, or palm wine).

NiV outbreaks in Bangladesh are seasonal and occur mainly between December and May, which is also the period when date palm sap is harvested. However, the Bangladesh government enforced a law after the 2011 outbreak which killed 21 children, banning the distribution of raw sap. The law is not implemented in the rural areas where the raw sap is still sold.

In developing countries, banning certain cultural practices are a common feature of health campaigns. But journalists can explore whether building rapport and trust with the residents of the affected community by providing strategies to make date palm safer for human consumption, instead of outrightly banning it, would be a better prerequisite to understanding local perception about the NiV outbreak and a critical early step in the emergency response.

Contact between humans and domestic animals is high, particularly in animal farms. Evidence shows that when bats that lost their natural habitat moved to fruit trees that had been planted close to piggeries, the pigs got infected from eating fruit contaminated with bat excrement. Farm workers picked up NiV from the they tended. Journalists need to investigate pig farms that are close to NiV outbreaks.

Journalists can promote the concept of how communities can function as 'citizen scientists' and contribute to detecting and reporting signs of illness to health authorities, effectively partnering with physicians and veterinarians in a broader response to NiV.



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### 7 Highlight the need for research to fill the knowledge gaps about NiV infections

Scientists are still in search of answers to the many questions about the Nipah virus. Here are a few key knowledge gaps:

The vast majority of experimental Nipah virus research in the past 20 years has been performed with a [single isolate](#) obtained from a patient during the Nipah virus outbreak in Malaysia. More recent work has expanded to include an isolate from a patient in Bangladesh. However, this still means that all experimental knowledge on Nipah virus has been derived from work with only two virus strains.

A perplexing question is why is respiratory disease and human-to human transmission of NiV more common in Bangladesh and India than in Malaysia?

The Bangladesh strain is slightly different from the Malaysian strain suggesting that the two strains of NiV have originated from two different populations of migrating bats. But it remains unclear why there is increased person-to-person transmission of NiV in Bangladesh, compared to Malaysia, when, at the molecular level, human isolates of NiV from Malaysia and Bangladesh are almost similar.

The NiV has been detected in bats in other geographical regions. The virus has been found in [fruit bats in Cambodia, Thailand and Madagascar](#), but no human cases have been reported so far. This lack of data could either reflect a gap in surveillance or may indicate that the necessary drivers of zoonotic transmission are missing in these regions.

### 8 Avoid conflating available evidence into alarmist stories

While covering NiV outbreaks, talk to epidemiologists to ensure that you interpret the data correctly for your audiences. Avoid scaremongering and instead give audiences evidence-based, explanatory stories that equip them to make sense of how serious the threat is and the precautions they can take at individual and community level.

NiV is on [WHO's Research and Development \(R&D\) Blueprint list of epidemic threats](#) reflecting concerns of the global health community that the virus could cause a serious global pandemic based on the following:

- Humans are already susceptible.
- Many strains are capable of limited person-to-person transmission.
- As an RNA virus, it has an exceptionally high rate of mutation.
- If a human-adapted strain were to infect communities in South Asia, high population densities and global interconnectedness would rapidly spread the infection.
- The virus currently has a case fatality rate of 45 to 75% and there is no vaccine or tried-and-tested treatment.

It's therefore critical for journalists to track NiV surveillance among animals and humans as well as what public health control measures are being undertaken in the case of an outbreak, that can prevent it from growing into epidemics and pandemics.



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### 9 Is Nipah virus related to the Hendra virus?

Nipah and Hendra (HeV) viruses are closely related members of the genus *Henipavirus*, subfamily *Paramyxovirinae*, and family *Paramyxoviridae*. Like the Nipah virus, HeV occurs naturally as a virus of fruit bats commonly known as 'flying foxes'. These are members of the genus *Pteropus*, family *Pteropodidae*. Like the Nipah virus, HeV has the zoonotic potential to also infect humans with severe disease.

Antibodies to HeV are found in all four Australian pteropus species. HeV predominantly causes infection in horses and can also lead to human disease (usually following contact with infected horses). HeV disease was initially recognized in 1994 following an outbreak of fatal cases of severe respiratory disease in horses and humans in the Brisbane suburb of Hendra in Queensland, Australia. That year, HeV caused the death of 13 horses and a horse trainer.

For the time being, confirmed HeV disease has been confined to Australia. The geographic distribution of *Pteropus* species which range from the east coast of Africa, through the Indian subcontinent and Southeast Asia, north to Okinawa in Japan and south to Australia, suggests that henipaviruses may also be found in flying fox populations in [geographically more diverse](#) locations.

An outbreak of an unidentified henipavirus (possibly NiV, or a closely related virus) occurred among horses and humans [in the Philippines in 2014](#). This outbreak likely involved spillover of the virus into horses and subsequent disease in humans following consumption of contaminated horsemeat.

A second Hendra virus with new genetic characteristics, or genotype, was reported in Australia in 2021. The genotype, designated HeV-g2, was classified by [researchers from CSIRO's Australian Centre for Disease Preparedness](#) following detection of the virus in grey-headed flying-foxes from Victoria and South Australia.

[HeV-g2 has also been detected in sick horses](#). It was initially detected in an historical sample from a horse euthanized in Queensland in 2015. The second detection was in a sick horse near Newcastle, New South Wales, in October 2021. The case from Newcastle is the most southern detection of Hendra virus in a horse to date.

These findings confirm that Hendra virus exists [in all areas of Australia](#) where flying-foxes occur. Hendra virus remains a potentially fatal zoonotic threat anywhere where flying foxes and horses co-exist.





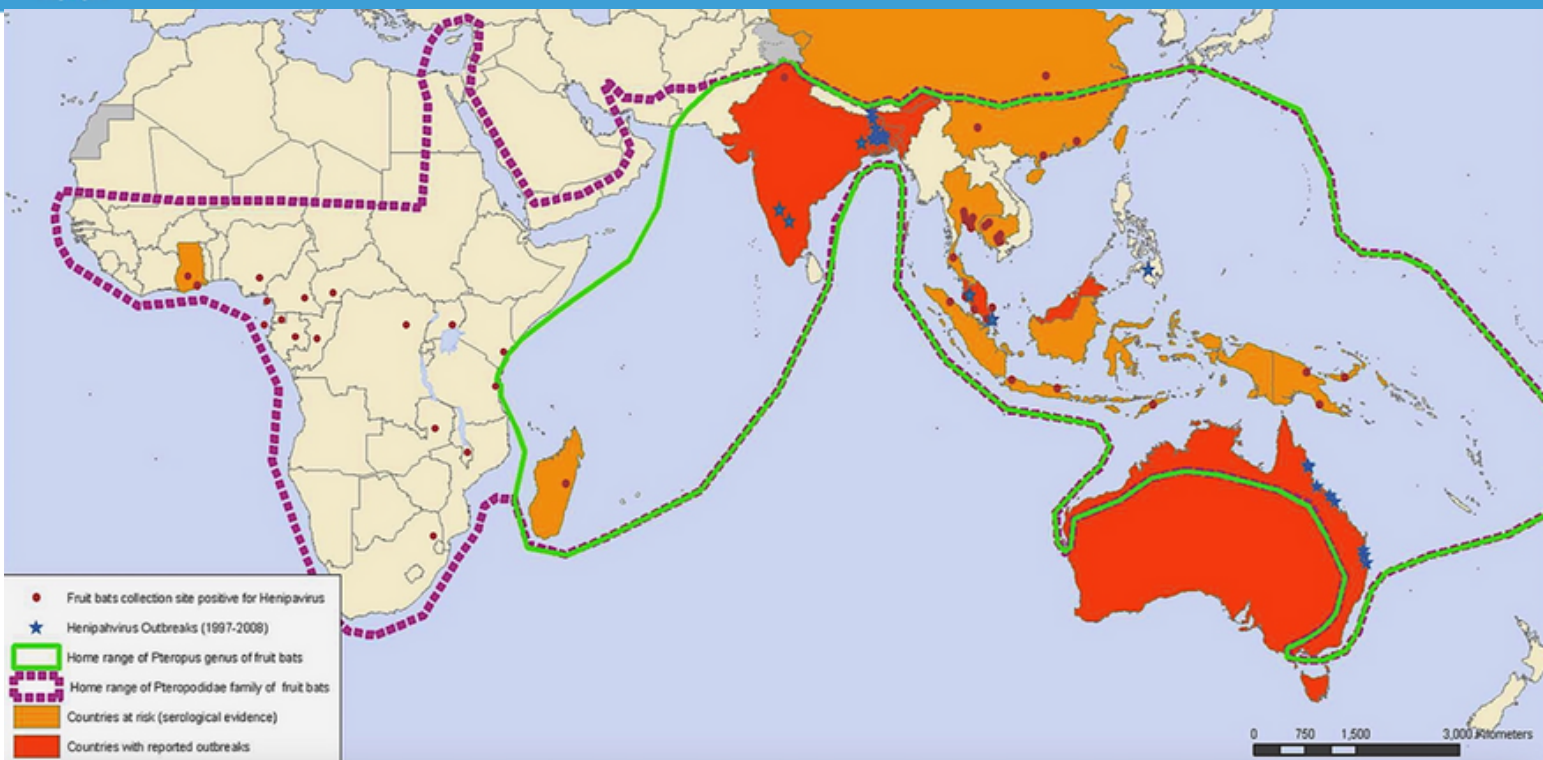
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 **World Health Organization** **Geographic distribution of Nipah and Hendra virus diseases outbreaks, 1997-2021.**



### References and further reading

#### Nipah Virus

[World Organization for Animal Health](#)

#### Nipah Virus Key Facts

[World Health Organization](#)

#### Manual on the diagnosis of Nipah virus infection in animals

[UN Food and Agriculture Organization](#)

#### From Reacting to Preventing Pandemics: Building Animal Health and Wildlife Systems for One Health in East Asia and Pacific

[The World Bank & UN Food and Agriculture Organization](#)

#### Reducing Pandemic Risks at Source: Wildlife, Environment and One Health Foundations in East and South Asia

[The World Bank & UN Food and Agriculture Organization](#)

#### One Health

[Journalism for One Health: The Internews Approach](#)

#### Zoonotic diseases

[Internews Earth Journalism Network: A journalists's guide to covering zoonotic diseases](#)