



Nipah Virus

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Key facts

To better understand public health terms included in this Disease Tool (e.g. What is a case definition? or What is an infectious agent?), consult our page on Key concepts in epidemiology.

Importance

Nipah virus infection is a zoonotic illness that is transmitted to people from animals, and can also be transmitted through contaminated food or directly from person-to-person. In infected people, it causes a range of illnesses from asymptomatic (subclinical) infection to acute respiratory illness and fatal encephalitis. The virus can also cause severe disease in animals such as pigs, resulting in significant economic losses for farmers.

Although Nipah virus has caused only a few known outbreaks in Asia including India, Bangladesh, Malaysia and Singapore, it infects a wide range of animals and causes severe disease and death in people. The case fatality rate is estimated at 40% to 75%.

Case definition

A **case definition** is a set of uniform criteria used to define a disease for public health surveillance. It enables public health officials to classify and count cases consistently.

*The following are standard case definitions to allow national health authorities to interpret data in an international context. However, during an outbreak case definitions may be adapted to the local context and the Red Cross Red Crescent should use those agreed/established by national health authorities. NB: Consider that during community-based surveillance, **volunteers** should use broad (simplified) case definitions (referred to as community case definitions) to recognize most or all possible cases, provide relevant risk communication and appropriate actions and encourage them to seek care. Other actors such as **healthcare workers or***

investigators studying the cause of a disease, on the other hand, can use more specific case definitions that may require laboratory confirmation.

As with other zoonotic diseases, control of Nipah virus infection among humans is highly dependent on the integration of the human health and veterinary surveillance and control systems. The following include case definitions for human surveillance and exclude case definitions for veterinary surveillance. For more information on veterinary surveillance or clinical presentations, please visit [WOAH's](#) page on Nipah virus.

Case Definitions

Suspected case

An individual from a community affected by a Nipah virus (NiV) disease outbreak who fulfils both of the following criteria is defined as a suspected case:

- Symptoms of acute encephalitis including
 - Acute onset of fever AND
 - Evidence of acute brain dysfunction including
 - Altered mental status OR
 - New onset of seizure OR
 - Any other neurological deficit
 - Headache or cough
- Epidemiological linkage including
 - Drinking raw date palm sap OR
 - Occurring during Nipah season OR
 - Patient from Nipah endemic area

Probable case

A person with:

- symptoms of acute encephalitis during a Nipah outbreak in the community
- with history of contact with suspect/confirmed case of Nipah

In both suspected and probable cases, the patient might present with respiratory symptoms with or without encephalitis. The symptoms include

- Illness < 7 days duration AND
- Acute onset of fever AND
- Severe shortness of breath, cough AND
- Chest radiograph showing diffuse infiltrates

Confirmed Nipah Case

- Suspected case who has laboratory confirmation of Nipah virus infection either by:
 - Nipah virus RNA identified by PCR from respiratory secretions, urine, or cerebrospinal fluid OR
 - IgM antibody against Nipah virus by ELISA in serum or cerebrospinal fluid OR
 - Isolation of Nipah virus from respiratory secretions, urine or cerebrospinal fluid.

Contact

A contact is defined as an individual who came in contact with a Nipah case (confirmed or probable cases) in at least one of the following ways.

- Was admitted simultaneously in a hospital ward/ shared room with a suspect/confirmed case of Nipah
- Has had direct close physical contact with the suspect/confirmed case of Nipah
- Has had direct close contact with the (deceased) suspect/confirmed case of Nipah at a funeral or during burial preparation rituals has touched the blood or body fluids (saliva, urine, vomitus etc.) of a suspect/confirmed case of Nipah during their illness has touched the clothes or linens of a suspect/confirmed case of Nipah

Definition of Cluster

- Two or more suspect cases living within a 30 minute walk of each other who develop symptoms within 21 days of each other.

https://cghealth.nic.in/cghealth17/Information/content/NipahVirus/Case_definition.pdf

Alert / epidemic threshold

An **alert threshold** is the pre-defined number of alerts that suggest the beginning of a possible disease outbreak and therefore warrant immediate notification.

Epidemic thresholds are the minimum number of cases indicating the beginning of a particular disease's outbreak.

Single case

Risk factors

- People living in regions with previous Nipah virus outbreaks
- Farmers and people working with or handling pigs in endemic regions.
- Individuals in close contact with infected patients are at increased risk of acquiring the virus

Attack rate (AR)

The **attack rate** is the risk of getting a disease during a specific time period (such as during an outbreak).

Attack rates will vary from one outbreak to another. In case of an outbreak, consult the latest information provided by health authorities.

- Generally low and depends on the type of exposure.

Groups at increased risk of severe illness (most vulnerable)

N/A

Infectious agent

Infectious agents are bacteria, viruses, fungi, prions and parasites. A disease caused by an infectious agent or its toxic products is defined as an infectious disease.

Nipah virus is a zoonotic pathogen that can cause severe disease in both animals and humans. It was first identified in Malaysia in 1998, where it caused an outbreak among pigs and subsequently spread to humans.

Reservoir / host

A **reservoir of infection** is a living organism or material in or on which an infectious agent lives and/or usually multiplies. Reservoirs include humans, animals and the environment.

A **susceptible host** is a person at risk of being infected. The level of susceptibility depends on age, sex, ethnicity and genetic factors, specific immunity also depends on other factors that affect an individual's ability to resist infection or to limit its ability to cause infection.

A **zoonotic disease** or **zoonosis** is an infectious disease that has jumped from a non-human animal to humans.

Zoonotic disease: Natural hosts are fruit bats of the *Pteropodidae* family

How disease is spread (modes of transmission)

Categorisation of **modes of transmission** varies from one agency to another. In addition, some infectious agents can be transmitted by more than one mode. A list of modes of transmission can be found in the key concepts to serve as guidance to better understand the diseases included in this website.

- Ingestion of raw date palm sap contaminated by Nipah virus.
- Person to person transmission of Nipah virus
 - From patient to caregiver, family or contact
 - From patient to health care worker,
 - Contact with objects used by patient
 - During handling and burial for the deceased
- Nipah virus can also be transmitted to humans from animals (such as bats or pigs).

Incubation period

This time from when infection occurs to the onset of symptoms is called the **incubation period**. It is a range of days and it can be different for each disease.

4 - 15 days, but there has been a report of 45 days.

Period of infectiousness

Period of infectiousness is the time interval during which an infected person can transmit the infection to other susceptible persons.

Humans are infectious.

Clinical signs and symptoms

The symptoms observed include fever, altered mental status, severe weakness, headache, respiratory distress, cough, vomiting, muscle pain, convulsion, and diarrhoea.

General Signs

- Raised temperature
- Increased respiratory rate (Adult: ≥ 25 /min; children of ≥ 12 months: ≥ 40 /min)
- Increased heart rate (Adult: ≥ 100 /min; children of ≥ 12 months: ≥ 140 /min)

- Breathing difficulties
- Hypertension/Hypotension

Neurological signs

- Eye abnormalities
- Facial weakness
- Limb weakness and movement abnormalities
- Reduced deep tendon reflexes

Other diseases with similar clinical signs and symptoms

Other viral encephalitis - Herpes simplex encephalitis and Japanese B Encephalitis (JBE); Bacterial meningitis; and Cerebral Malaria.

Diagnosis

- Enzyme-linked immunoassay - The diagnosis of Nipah virus infection can be established by enzyme-linked immunoassay (ELISA).
- Polymerase chain reaction (PCR) - RT PCRs can be used for detection of viral sequences in the cerebrospinal fluid, throat swab or urine specimens.
- Isolation of Nipah virus from respiratory secretions, urine or cerebrospinal fluid.

Vaccine or treatment

Please refer to the appropriate local or international guidelines for clinical management. All clinical management including the administration of a treatment or vaccine should be conducted by a health professional.

- Currently there is no known treatment or vaccine available for either people or animals. However, antivirals may have a role in reducing mortality among patients with encephalitis caused by Nipah virus disease.
- Intensive supportive care with treatment of symptoms is the main approach to managing the infection in people.

Immunity

There are two types of immunity:

- **Active immunity** results when exposure to an agent triggers the immune system to produce antibodies to that disease.
- **Passive immunity** is provided when a person is given antibodies to a disease rather than producing them through his or her own immune system.

No vaccines yet

Which interventions are most effective for prevention and control?

The following is a list of activities considered for Red Cross Red Crescent volunteers to take part in. It is not an exhaustive list of all prevention and control activities for the specific disease.

- Communicate risks about the disease or epidemic, not only to share information on prevention and mitigation measures, but also to encourage informed decision-making, positive behaviour change and maintenance of trust in the Red Cross Red Crescent response. This includes the identification of rumours and misinformation around disease—frequent during health emergencies—to manage them appropriately. Volunteers should use the most context-appropriate communication techniques (ranging from social media to face-to-face interactions).
- Community education and engagement activities to encourage the adoption of protective behaviours including:
 - Use of appropriate Personal Protective Equipment (PPE) when caring for infected patients
 - Boiling of date palm juice and thorough washing of other fruits before consumption
 - Discarding fruits and vegetables with bite marks

Epidemic characteristics and RCRC indicators and targets

The first table below includes data that should be gathered from health authorities and relevant non-governmental actors to understand the progress and characteristics of the epidemic in the specific country and area of intervention. The second table includes a list of suggested indicators that can be used for monitoring and evaluating Red Cross Red Crescent activities; wording of indicators may be adapted to specific contexts. Target values for a specific indicator can vary widely from one context to another and therefore managers should define them based on the specific population, area of intervention and programmatic capacity. Exceptionally, some indicators in this website may include target values when these are globally agreed as a standard; e.g. 80 per cent of individuals who slept under an insecticide-treated net (ITN) the previous night—the normative World Health Organization benchmark for universal coverage with ITNs.

Epidemic characteristics and progression
Suspected cases per week (disaggregate by age, sex)
Confirmed cases per week (disaggregate by age, sex)
Case fatality rate
Indicators for Red Cross Red Crescent activities
<p>Number of volunteers trained on a specific topic (e.g. Epidemic Control for Volunteers (ECV); Community-based surveillance (CBS); WASH training; CBHFA training, etc.)</p> <p>Numerator: Number of volunteers trained Source of information: Training attendance sheets</p>
<p>Suspect cases detected by volunteers who were encouraged to seek healthcare and who arrived at a health facility</p> <p>Numerator: Nipah virus suspect cases detected by volunteers in a determined period preceding this survey (e.g. two weeks) for whom advice or treatment was sought from a health facility Denominator: Total number of people who are Nipah virus suspect cases in the same period preceding the survey Source of information: Survey</p>
<p>Percentage of people recognizing at least one transmission route and at least one measure for preventing it</p> <p>Numerator: Total number of people who recognized at least one transmission route and at least one measure for preventing it during the survey Denominator: Total number of people surveyed Source of information: Survey</p>
<p>Percentage of people who know the cause, symptoms, treatment or preventive measures</p> <p>Numerator: Number of people who cite the cause, symptoms, treatment or preventive measures Denominator: Number of people surveyed</p>

See also:

- For Community Engagement and Accountability (CEA) indicators for activities accompanying ECV actions, please refer to:

IFRC CEA toolkit (*Tool 7.1: Template CEA logframe, activities and indicators*). Available at: <https://www.ifrc.org/document/cea-toolkit>

- For community-based surveillance guidance please see:

IFRC, Norwegian Red Cross, Croix-Rouge de Belgique (2022), *Community Based Surveillance Resources*. Available at: <https://cbs.ifrc.org/resources>

Impact on other sectors

Sector	Link to the disease
WASH	Nipah virus transmission can be facilitated by poor hygiene and inadequate water and sanitation. Improving access to clean water, sanitation and promoting good food hygiene practices are crucial for prevention and controlling outbreaks.
Food security	Nipah virus can be transmitted by contaminated date palm fruits. Hence proper food preparation including boiling of date palm juice and thorough washing of other fruits before consumption are effective control measures for Nipah virus.
Nutrition	Malnutrition increases the risk for severe Nipah virus.
Shelter and settlements (including household items)	Housing located close to vegetations and wildlife can be exposed to Nipah virus through vectors like fruit bats. Routine clearing of the surrounding vegetation and bat removal will help prevent Nipah virus.
Psychosocial support and Mental health	Nipah virus is a stigmatised disease and can have several negative impacts on psychological, social and emotional aspects of a person's life, apart from its physical effects only. Psychological reactions may include fear of social stigma, anxiety and worry about the outcome, social withdrawal, among others. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6065135/
Sex and Gender	Although studies suggest that males may be more susceptible to Nipah virus, the risk of infection can vary based on gender roles-men through occupational risks, and women through caregiving. Vulnerable groups like pregnant women and infants may also face higher risks due to limited access to care.
Education	Importantly, schools and other facilities dedicated to children and youth can offer an important space for them to engage, mobilise and raise awareness around health education issues. With support, trust and appropriate capacity-building, young people can be effective advocates for the adoption of preventive measures during an epidemic and are those best placed to mobilise their peers.

Sector	Link to the disease
Livelihoods	Outbreaks of Nipah virus can lead to significant public health challenges, including the need for strict infection control measures, increased demand for healthcare resources, and economic impact due to livestock loss and reduced agricultural productivity. Fear and stigma associated with the disease can also lead to social disruption.

Resources:

- <https://dhs.kerala.gov.in/wp-content/uploads/2021/09/Nipah-Guidelines-9-04-21-2-1.pdf>
- <https://www.ecdc.europa.eu/en/infectious-disease-topics/nipah-virus-disease/factsheet-nipah-virus-disease>
- <https://www.who.int/news-room/fact-sheets/detail/nipah-virus>
- https://www.iedcr.org/pdf/files/nipah/National_Nipah.pdf
- <https://www.woah.org/en/disease/nipah-virus/>