

RI LANKA 202

# WEEKLY EPIDEMIOLOGICAL REPORT

# A publication of the Epidemiology Unit

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# 18<sup>th</sup>- 24<sup>th</sup> Nov 2023

Nipah Virus outbreaks Part I

This is the first article of a series of 3 articles on the "Nipah Virus outbreaks.".

### **Twenty Years and More of Nipah Virus in** South Asia

Emerging viral diseases have a great impact on public health. Several viral outbreaks have been documented in the past few years in different regions of the world such as the Crimean-Congo hemorrhagic fever, Ebola, Lassa fever, Marburg virus, Nipah, Rift Valley Fever and COVID. These can contribute to considerable mortality, morbidity and economic losses which are felt around the globe. Established viruses such as influenza are also capable of reemerging and presenting new threats. According to literature, since the year 1980, only about 87 out of 1399 human pathogens infect humans directly, while a majority initially infect other susceptible animals which then spread the infection to humans.<sup>1,2</sup> Further, a systematic assessment conducted by Wolfe and colleagues revealed that 80% of the most devastating infectious diseases in human history were zoonoses.<sup>3</sup>

### Nipah virus: Pathogen and clinical onset

The Nipah virus (NiV) is a notorious zoonotic pathogen, which belongs to the genus Henipavirus of the Paramyxoviridae family. It can cause a spectrum of symptoms from mild to severe encephalitis or respiratory illness in both humans and animals. The wildlife reservoir of NiV is fruit bats of the genus Pteropus. It does not cause any apparent disease in infected bats.<sup>4</sup> In humans, the NiV infection causes a widespread vasculitis with the brain and lung being the most commonly affected organs. Common symptoms include fever, headache, reduced level of consciousness, focal neurological signs and cough. Most who are infected, end up developing severe disease.



## Figure 1 - Flying foxes are a natural reservoir of Nipah virus. Source: Nick Greaves/Alamy Stock Photo

### Is Nipah a new disease?

A wide distribution of henipaviruses among Pteropus bats and related species coupled with the lack of symptoms in infected bats suggests that the NiV co-evolved with the Pteropus bats. As people have also been harvesting date palm sap in South Asia for centuries (fruit bats usually lick the sap as it is being collected), it is possible that human infections have been occurring sporadically. Its potentially long history of occasional human infection without a sustained person-to-person transmission provides reassurance that it is not an immediate high risk for a potential pandemic.

#### **Past and Present Nipah Outbreaks**

Several countries have reported NiV outbreaks, including Bangladesh, India, the Philippines, Malaysia and Singapore. In India, outbreaks have been reported in the states of West Bengal (2001 and 2007) and Kerala (2018, 2021 & 2023). Outbreaks in Malaysia, Singapore and Philippines haven't recurred. However, almost yearly outbreaks have continued to occur in Bangladesh.

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# Pteropus Bats Presence and Nipah Virus Outbreaks

Known or likely presence of Pteropus bats in the Asia, South Pacific, and Australia region

## Initial outbreak in Malaysia & Singapore

The Nipah virus outbreak first burst upon the world from the September 1998 – May 1999 outbreak in the states of Perak, Negeri Sembilan and Selangor in Malaysia. What the Malaysian health authorities thought at first to be an outbreak of Japanese Encephalitis (JE) infection, resulted in hampering the deployment of effective measures to prevent the spread of the disease. The disease was finally identified as a newly discovered agent and termed as the Nipah Virus (NiV).<sup>2,5</sup>

The virus initially struck pig farms, presenting with signs of respiratory illness and encephalitis and led to confusion among health officials, of having being caused by JE, due to four out of 28 infected humans in the area having tested positive for JE-specific Immunoglobulin M (IgM). The disease then spread to surrounding states, due to farmers who had been impacted by the control measures selling the infected pigs to these areas. This spread resulted in a total of 265 cases of NiV with over 100 related deaths (39.6%). The disease was then found among 'abattoir workers' - those who manage animals before and during the slaughtering process - in Singapore, due to them having handled infected pigs imported from Malaysia resulting in a further 11 cases and one death.<sup>5</sup> Although these outbreaks were comparatively small, mortality rates were quite high which led to panic in the affected areas.

As the cause had been wrongly identified initially, control measures such as mosquito fogging and vaccination of pigs against JE were carried out in the affected areas which were found to be ineffective, as more cases emerged despite these measures. This led to increasing nationwide panic along with the almost total collapse of the pig farming industry. However, as the disease was affecting more adults than children, including those who had been vaccinated earlier against JE, Health Care Workers (HCW) were increasingly unconvinced that the outbreak was being caused by JE. Further investigations and autopsies revealed that all the infected people had had direct physical contact with pigs and all the infected pigs had displayed signs of severe respiratory illness prior to dying. In early 1999, a local virologist at the University of Malaya discovered the root cause of the infection by a new agent termed the Nipah Virus (NiV), named after the investigation area -Nipah River Village (in Malay: Kampung Sungai Nipah). The origin of the virus was found to be from a native fruit bad species. The novel virus was recognized as a new genus, Henipavirus (Hendra virus + Nipah virus) in the Paramyxoviridae family.<sup>5</sup> Following these findings, surveillance of the pig populations including the culling of over a million pigs was carried out, with the last human fatality occurring on 27 May 1999 from this outbreak. Similarly, the outbreak in Singapore subsided with the immediate prohibition on pig importation into the country, culling of pigs, avoiding contact with NiVinfected pigs and closure of abattoirs.

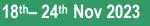
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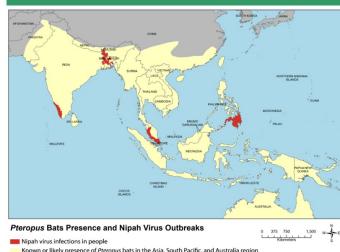
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18<sup>th</sup>- 24<sup>th</sup> Nov 2023

Table 1: Selected notifiable diseases reported by Medical Officers of Health	11 <sup>th</sup> –17 <sup>th</sup> Nov 2023 (46 <sup>th</sup> Week)
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Human	A	6 0	0 6	0 0	5 0	8	6 0	2 0	0 6	7 0	7 0	1	1	3 0	1	8	2 0	5 0	5 0	1	4 0	6 0	3	0	8	6 0	0 0	0	otio otio
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# Table 2: Vaccine-Preventable Diseases & AFP

# 18th- 24th Nov 2023

# 11<sup>th</sup>-17<sup>th</sup> Nov 2023 (46<sup>th</sup> Week)

Disease	No. of Cases by Province										Number of cases during same	Total number of cases to date in	Total num- ber of cases to date in	Difference between the number of cases to date	
	W	С	S	Ν	E	NW	NC	U	Sab	week in 2023	week in 2022	2023	2022	in 2023 & 2022	
AFP*	00	01	00	00	00	01	00	00	00	02	03	86	73	17.8 %	
Diphtheria	00	01	00	00	00	00	00	00	00	00	00	00	00	0 %	
Mumps	00	00	00	00	01	00	00	00	00	01	03	211	84	151.2 %	
Measles	09	04	01	01	00	00	00	00	00	15	04	730	31	2254.8 %	
Rubella	00	00	00	00	00	00	00	00	00	00	00	09	00	0 %	
CRS**	00	00	00	00	00	00	00	00	00	00	00	02	00	0 %	
Tetanus	00	00	00	00	00	00	00	00	00	00	00	06	05	20 %	
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %	
Japanese Enceph- alitis	00	00	00	00	00	00	00	00	00	00	01	04	10	-60 %	
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	07	01	600 %	
Tuberculosis	49	14	11	13	14	40	02	09	05	157	54	8181	6004	36.3%	

## Key to Table 1 & 2

Provinces: W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.

RDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matale, NE: Nuwara Eliya, GL: Galle, HB: Hambantota, MT: Matara, JF: Jaffna,

KN: Killinochchi, MN: Mannar, VA: Vavuniya, MU: Mullaitivu, BT: Batticaloa, AM: Ampara, TR: Trincomalee, KM: Kalmunai, KR: Kurunegala, PU: Puttalam, AP: Anuradhapura, PO: Polonnaruwa, BD: Badulla, MO: Moneragala, RP: Ratnapura, KG: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS, Special Surveillance: AFP\* (Acute Flaccid Paralysis), Japanese Encephalitis

**CRS**\*\* =Congenital Rubella Syndrome **NA** = Not Available

Number of Malaria Cases Up to End of November 2023, 05 All are Imported!!!

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# **ON STATE SERVICE**

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