



WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health

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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.^{1,2} Further, a systematic assessment conducted by Wolfe and colleagues revealed that 80% of the most devastating infectious diseases in human history were zoonoses.³

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.⁴ 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

■ Nipah virus infections in people
■ 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).^{2,5}

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.⁵ 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 bat species. The novel virus was recognized as a new genus, Henipavirus (Hendra virus + Nipah virus) in the Paramyxoviridae family.⁵ 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 NiV-infected pigs and closure of abattoirs.

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Table 1: Selected notifiable diseases reported by Medical Officers of Health 11th- 17th Nov 2023 (46th Week)

RDHS	Dengue Fever		Dysentery		Encephalit		Enteric Fever		Food Poi-		Leptospirosis		Typhus		Viral		Human		Chickenpox		Meningitis		Leishmania-		WRCD		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**	
Colombo	193	12859	0	15	0	14	0	2	0	12	9	327	0	0	0	0	6	0	0	8	336	0	42	0	7	41	100
Gampaha	38	12555	0	21	0	20	0	13	0	14	5	571	0	11	0	19	0	0	0	0	282	0	124	0	44	10	99
Kalutara	0	4414	0	28	0	4	0	1	0	19	0	808	0	2	0	10	0	1	0	0	519	0	97	0	4	330	100
Kandy	0	7219	0	41	0	3	0	11	0	23	0	290	0	64	0	5	0	2	0	0	307	0	30	0	34	86	100
Matale	26	1642	0	4	0	3	0	1	0	29	0	137	0	14	1	8	0	0	1	71	1	10	2	316	26	99	
NuwaraEliya	13	291	1	156	0	5	0	3	0	50	3	179	1	74	1	6	0	0	6	199	1	34	0	3	59	100	
Galle	83	2900	2	51	0	14	0	6	1	38	7	877	1	73	0	2	0	1	1	356	0	31	0	3	37	100	
Hambantota	7	1333	0	14	0	4	0	1	0	9	4	311	0	68	0	9	0	0	1	144	0	19	1	617	32	100	
Matarara	10	1834	0	28	0	9	0	1	0	69	4	511	0	34	0	7	0	2	1	295	1	23	0	182	56	100	
Jaffna	100	2347	10	137	0	2	1	14	0	39	0	14	7	538	0	7	0	2	5	180	1	19	0	2	70	93	
Kilinochchi	2	98	1	17	0	0	0	1	2	18	0	8	0	8	0	1	0	0	0	19	0	2	0	0	46	100	
Mannar	3	99	0	7	0	0	0	1	0	0	0	39	0	6	0	1	0	0	3	0	3	0	10	0	1	56	100
Vavuniya	3	179	2	14	0	1	0	0	1	26	3	35	0	10	1	3	0	0	2	31	1	15	1	11	20	100	
Mullaitivu	0	127	0	15	0	1	0	5	0	12	0	40	0	7	0	1	0	0	0	19	0	2	0	8	28	99	
Batticaloa	13	2262	2	199	1	11	0	5	0	18	3	104	0	2	0	8	0	3	2	128	2	47	0	1	66	99	
Ampara	4	253	0	17	0	1	0	1	0	69	0	126	0	2	0	2	0	0	2	93	3	62	0	12	14	100	
Trincomalee	6	2057	2	27	0	1	0	1	0	69	1	75	0	15	0	5	0	0	0	83	1	30	0	7	30	100	
Kurunegala	48	3038	2	61	1	17	0	1	2	9	12	427	0	19	0	15	0	3	3	504	2	206	7	558	29	100	
Puttalam	31	3066	0	43	2	5	0	1	0	2	4	107	0	8	0	1	0	0	7	119	4	84	0	23	29	100	
Anuradhapur	5	726	0	16	0	1	0	1	0	11	4	269	0	33	0	4	0	2	2	230	2	49	6	662	30	99	
Polonnaruwa	8	577	1	26	0	6	0	1	0	11	10	180	1	9	1	16	0	0	2	91	0	18	4	415	36	100	
Badulla	30	1197	1	44	1	6	0	0	0	45	3	332	0	61	1	93	0	0	5	192	0	49	2	43	65	99	
Monaragala	2	699	0	26	0	6	0	0	0	8	3	505	0	39	0	33	0	1	0	74	0	80	0	178	30	100	
Ratnapura	17	2077	0	59	0	19	0	3	1	57	9	1182	1	30	0	18	0	2	4	223	0	141	0	185	36	99	
Kegalle	14	2989	0	26	0	2	0	2	0	19	13	701	0	45	0	6	0	0	5	444	1	93	0	42	35	100	
Kalmune	2	1713	0	70	0	12	0	0	0	2	0	58	0	1	0	0	0	0	6	169	1	42	0	0	52	100	
SRILANKA	658	68551	24	1162	5	167	1	76	7	678	97	8213	11	1173	5	286	0	19	63	5111	21	1359	23	3358	42	99	

Source: Weekly Returns of Communicable Diseases (esurveillance.epid.gov.lk). T=Timeliness refers to returns received on or before 17th Nov, 2023. Total number of reporting units 358. Number of reporting units data provided for the current week: 358. C**=Completeness. A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

11th–17th Nov 2023 (46th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2023	Number of cases during same week in 2022	Total number of cases to date in 2023	Total number of cases to date in 2022	Difference between the number of cases to date in 2023 & 2022
	W	C	S	N	E	NW	NC	U	Sab					
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 Encephalitis	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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