



WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health

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Nipah Virus outbreaks Part II

This is the second article of a series of 3 articles on the “Nipah Virus outbreaks.”

How did this virus jump to humans?

Once the culling of over a one million pig population was carried out in affected states in Malaysia, the outbreak completely subsided which led to the question of where the pigs got the virus. Further studies revealed that pigs had been contracting the Nipah virus for years which had been likely picked up from bats.⁶ However, these outbreaks were quite small and went unnoticed as the pig farms were small as well, being usually run by families. The economic boom in the nineties in Malaysia meant that pork could be eaten more frequently by a larger proportion of families, leading to increased demand for pork. Thus, in response, the pig farming industry adapted by changing the way that pigs were raised. Pigs were packed

into tight quarters and farms were industrialized to enable the production of more meat with fewer resources. However, this is where the issue arises when it comes to communicable diseases. If a virus was able to get into pigs, it could multiply and spread rapidly, thus hopping on over to other farms and eventually into the farmers themselves. With the changes in the way that our food has grown, so have the changes in the way diseases spread. Agricultural industrialization along with factory farming, with all its benefits, also can thus trigger such outbreaks. This has been seen in strains of MRSA, bird flu, swine flu and now Nipah.

Although a repeat outbreak has not been reported since 1999 from Malaysia & Singapore, subsequent outbreaks have been reported in Bangladesh, India, and the Philippines.

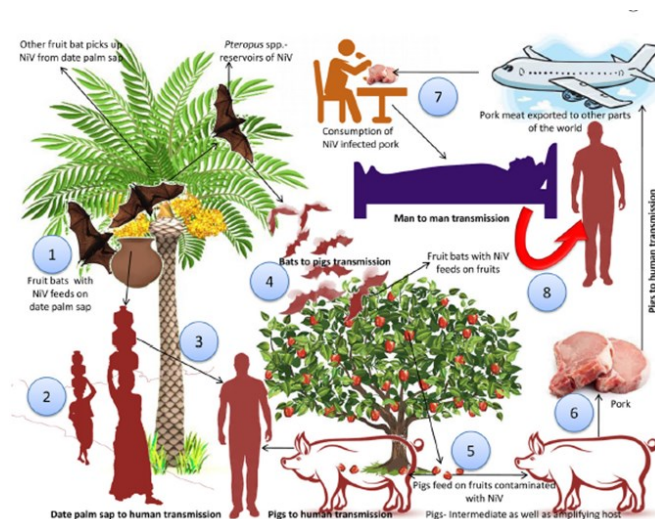


Figure 2. Transmission of the Nipah virus. 1. Fruit bats acts as natural reservoir of Nipah viruses. Fruit bats with NIV feeds on date palm sap. Virus can survive in solutions that are rich in sugar, viz., fruit pulp. 2. Virus transmitted to human through the consumption of date palm sap. 3. Fruit bats of *Pteropus* spp. which are NIV reservoirs visited such fruit trees and got opportunity to naturally spill the drop containing virus in the farm to contaminate the farm soil and fruits. 4. Contaminated fruits are consumed by pigs and other animals. Pigs act as intermediate as well as amplifying host. Combination of close surroundings of fruiting trees, fruits-like date palm, fruit bats, pigs and human altogether form the base of emergence and spread of new deadly zoonotic virus infection like Nipah. 5. Pork meat infected with NIV are exported to other parts. 6. Consumption of infected pork can act as a source of infection to human. 7. Close contact with NIV affected human can lead to spread of NIV to other persons.

Figure 3 - Transmission of the Nipah Virus; Singh et al (2019)

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Nipah Outbreaks in India

Early 2001 saw an outbreak of infectious febrile illnesses occurring in Siliguri city (Northern part of West Bengal). This was initially suspected to be due to the Measles virus, but retrospectively, NiV was found via serological analysis of the serum of infected patients. The outbreak was sudden and dangerous with 66 laboratory-confirmed cases, of which at least 43 (68%) succumbed to the disease. All the cases were adults without any history of pig or animal exposure although with some evidence of nosocomial transmission. There was no role for pigs during this transmission, with mainly person-to-person contact primarily in hospital settings taking place. The second outbreak of NiV in India took place in April 2007 in the village of Belechuapara near the Bangladesh border in West Bengal. While this outbreak only had five cases, case fatality was 100%. However, the third outbreak in May 2018, was reported from another district called Kozhikode of Kerala in the southern part of India. This outbreak began with the death of three individuals within the same family accompanied by the death of a healthcare worker who also succumbed to the infection. The cause of the infection was hypothesized to be due to the interference of humans into a bat habitat. Samples of bats from the *Pteropus* genus from the Kozhikode district were tested and revealed 10 of 52 samples testing positive for NiV by RT-PCR. Droplet infection was thought to have facilitated human-to-human transmission. This outbreak was responsible for 18 cases of which 17 persons (94.4%) succumbed to the infection.⁷ Subsequent outbreaks in 2019 and 2021 occurred in Kerala in the Ernakulum and Kozhikode districts with one case each. Currently, in 2023, the same Kozhikode district in Kerala is experiencing its third outbreak with it being the fourth outbreak in the Kerala state in August - September 2023 with a current total of 6 cases and 2 deaths so far. All infected cases were males aged between nine and 45 years. All six cases have been linked to each other either being related or with evidence of nosocomial transmission. For the current outbreak, strong and immediate public health measures were taken by the district health authorities probably due to their experience with previous outbreaks. Coordination among several health teams to aid in containment, immediate lockdown of affected areas in the district, closing of public places such as schools and hospitals, enhanced surveillance and contact tracing including quarantining of high-risk contacts including HCWs was carried out. Laboratory testing revealed no positive environmental or animal samples so far. Other control measures included improving health facility preparedness, infection and prevention control training of HCWs, ensuring adequate PPE, ensuring standard protocol is followed with management of infected bodies, risk communication activities, and collaboration with the animal sector. Outbreaks in India have been considerably smaller than the outbreak in Malaysia, but as noted have been occurring frequently since 2001, lending credence to the idea that the virus may have been infecting humans for many years, albeit undetected.⁷

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Table 1: Selected notifiable diseases reported by Medical Officers of Health 18th- 24th Nov 2023 (47th 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	155	13016	0	15	4	18	2	4	0	12	13	340	0	0	0	0	6	0	0	8	344	2	44	0	7	40	100
Gampaha	32	12615	0	21	0	21	0	13	0	14	9	581	0	12	1	20	0	0	0	6	291	1	125	0	44	10	100
Kalutara	1	4428	0	28	0	5	0	1	0	19	0	809	0	2	0	10	0	1	0	0	519	0	97	0	4	330	100
Kandy	33	7286	0	41	0	3	0	11	0	23	0	290	0	64	0	5	0	2	2	2	311	0	30	0	34	84	100
Matale	38	1685	1	5	0	3	0	1	1	30	0	137	0	14	0	8	0	0	0	0	71	0	10	2	318	26	100
NuwaraEliya	17	308	1	157	0	5	0	3	1	51	4	183	0	74	0	6	0	0	4	4	203	0	34	0	3	58	100
Galle	89	2991	0	51	1	15	0	6	1	39	5	884	0	73	0	2	0	1	2	2	358	0	31	0	3	37	100
Hambantota	7	1340	0	14	0	4	0	1	0	9	3	314	0	68	0	9	0	0	0	0	144	0	19	1	618	31	100
Matara	4	1838	0	28	0	9	0	1	0	69	3	514	0	34	0	7	0	2	0	0	295	0	23	0	182	55	100
Jaffna	141	2488	6	143	0	2	1	15	3	42	0	14	10	548	0	7	0	2	2	5	185	0	19	0	2	69	93
Kilinochchi	7	105	2	19	0	0	0	1	0	18	1	9	0	8	0	1	0	0	0	0	19	0	2	0	0	47	100
Mannar	1	100	0	7	0	0	0	1	0	0	0	39	0	6	0	1	0	0	0	0	3	0	10	0	1	55	100
Vavuniya	4	183	0	14	0	1	0	0	0	26	2	37	0	10	0	3	0	0	3	34	2	17	0	11	19	100	
Mullaitivu	0	127	0	15	0	1	0	5	0	12	0	40	0	7	0	1	0	0	0	0	19	0	2	0	8	27	99
Batticaloa	22	2287	6	207	0	11	0	5	0	18	5	109	0	2	0	8	1	4	1	130	1	48	0	1	64	100	
Ampara	3	256	0	17	0	1	0	1	1	70	8	134	0	2	0	2	0	0	1	94	0	62	0	12	14	100	
Trincomalee	5	2062	1	28	0	1	0	1	0	69	0	75	0	15	0	5	0	0	3	86	0	30	0	7	30	100	
Kurunegala	50	3064	1	62	0	17	0	1	0	9	6	439	0	19	0	15	0	3	4	508	2	210	3	561	29	100	
Puttalam	28	3122	2	45	0	5	0	1	0	2	1	111	0	9	0	1	0	0	4	123	1	85	0	23	28	100	
Anuradhapur	0	726	0	16	0	1	0	1	0	11	2	273	0	33	0	4	0	2	1	231	0	49	0	666	29	99	
Polonnaruwa	13	590	0	26	0	6	0	1	0	11	8	188	0	9	0	16	0	0	1	92	0	18	1	416	36	99	
Badulla	48	1304	0	45	0	6	0	0	0	45	1	333	2	63	2	95	0	0	0	192	0	49	0	43	63	99	
Monaragala	1	700	0	26	0	6	0	0	0	8	0	505	0	39	0	33	0	1	0	74	0	80	0	178	30	100	
Ratnapura	22	2111	2	61	0	19	0	3	1	58	7	1200	0	30	0	18	0	2	5	228	1	142	0	187	35	99	
Kegalle	5	2994	0	26	0	2	0	2	0	19	2	703	0	45	0	6	0	0	5	449	0	93	1	43	34	100	
Kalmune	1	1714	1	71	0	12	0	0	2	4	2	60	0	1	0	0	0	0	4	176	0	42	0	0	51	100	
SRILANKA	727	69440	23	1188	5	174	3	79	10	688	82	8321	12	1187	3	289	1	20	59	5179	10	1371	8	3372	41	99	

Source: Weekly Returns of Communicable Diseases (esurveillance.epid.gov.lk). T=Timeliness refers to returns received on or before 24th Nov, 2023. Total number of reporting units 358. Number of reporting units data provided for the current week: 339. C**=Completeness. A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

18th– 24th Nov 2023 (47th 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	01	86	74	16.2 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	00	00	00	00	00	00	00	00	00	00	00	212	85	149.4 %
Measles	08	00	00	03	00	00	00	00	00	11	02	747	34	2097 %
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	02	04	12	-66.6 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	07	01	600 %
Tuberculosis	99	15	15	08	24	00	04	10	19	194	48	8375	6052	38.38%

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

Take prophylaxis medications for leptospirosis during the paddy cultivation and harvesting seasons.

It is provided free by the MOH office / Public Health Inspectors.

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