



**LESSONS LEARNED FROM NIPAH VIRUS
OUTBREAK
IN KERALA**

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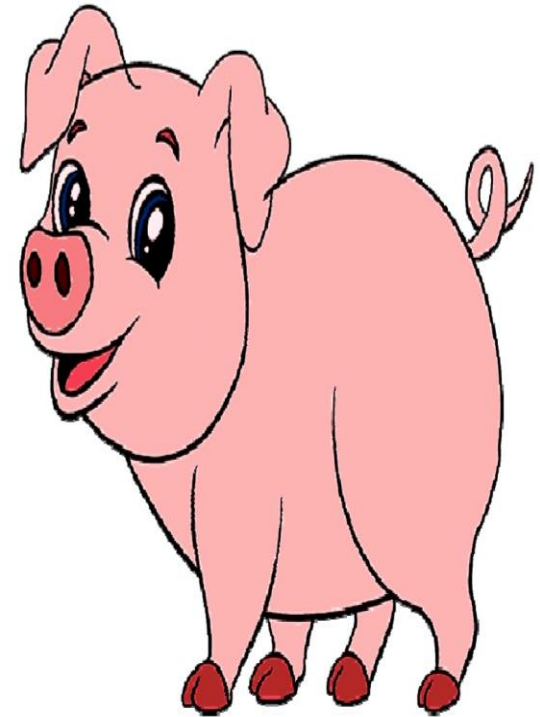
NIPAH VIRUS INFECTION-AN OUTLINE



NIPAH.....

- ✘ An emerging viral infection
- ✘ Cause severe disease in animals & human beings
- ✘ Natural reservoirs-Bats
- ✘ Intermediate hosts-Pigs

PTEROPODIDAE/ FRUIT BATS/ FLYING FOXES AND PIGS (INTERMEDIATE HOST)



A BRIEF LOOK INTO HISTORY

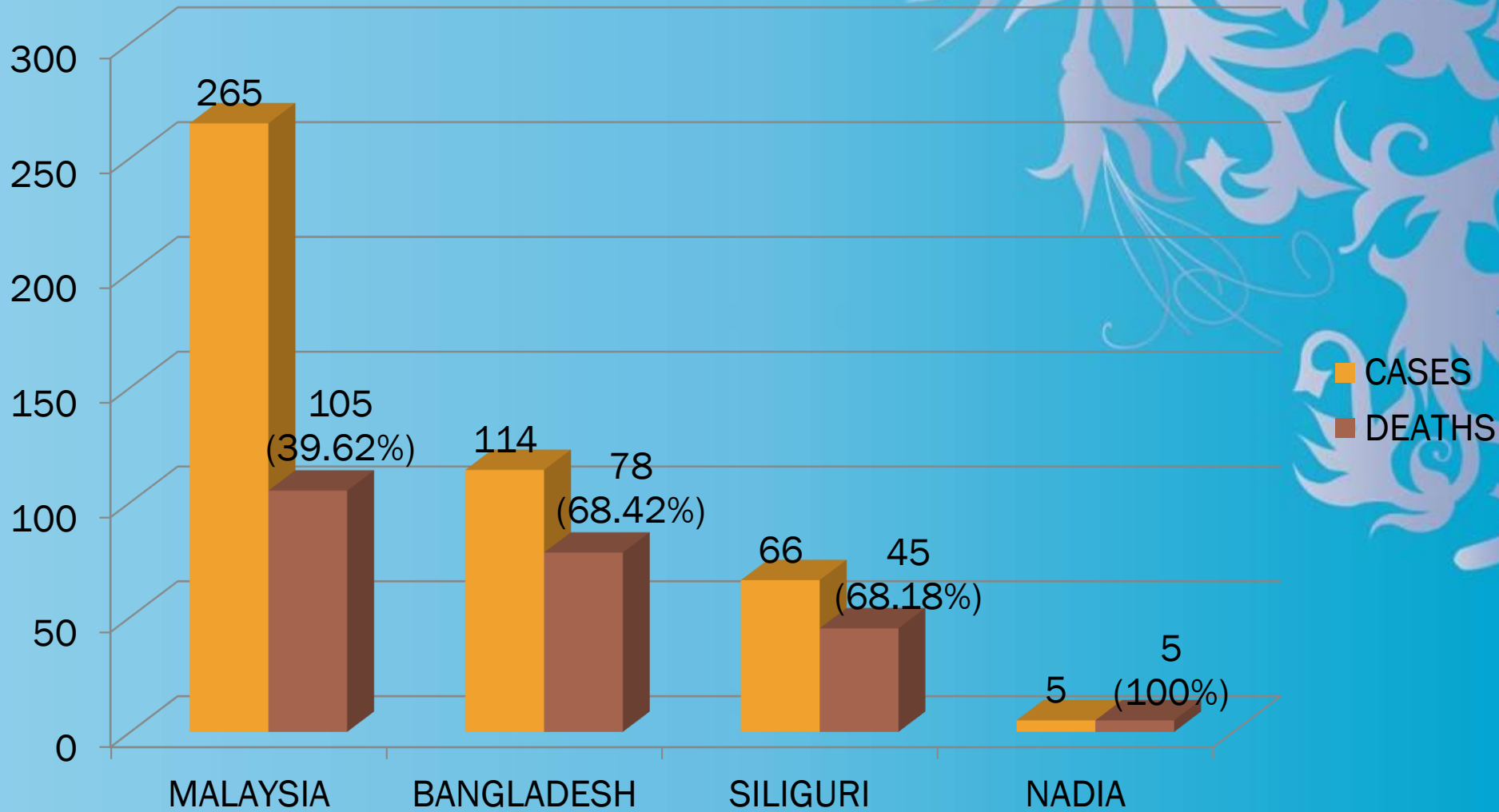
- ✘ Malaysia-1998-Camboog Sungay NIPAH...
- ✘ Pigs were intermediate hosts
- ✘ Initially considered as Japanese encephalitis
- ✘ Singapore – same period
- ✘ >300 cases & >100 deaths





-
- ✘ Bangladesh-2001-2004-Dates contaminated by infected bats
 - ✘ West Bengal-2001-Siliguri and 2007-Nadia
 - ✘ Further human to human transmission
 - ✘ Nearly 150 deaths in & around Bangladesh
 - ✘ Mortality 50 – 75 %

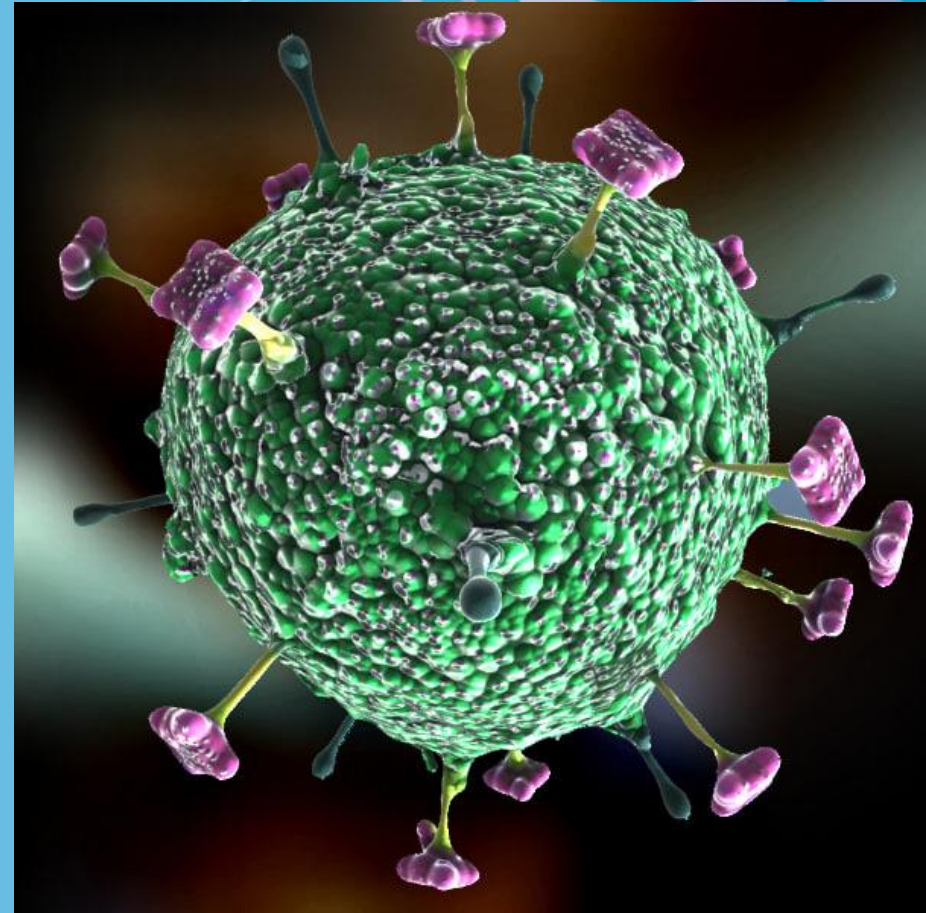
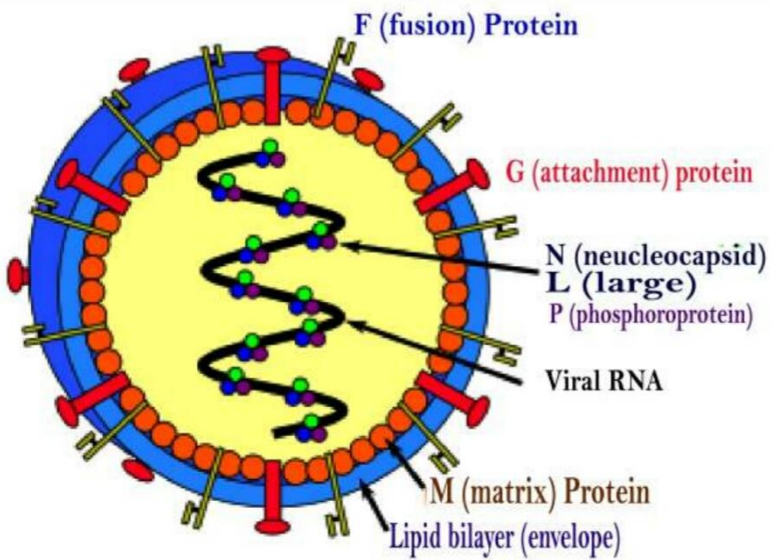
NIPAH OUTBREAKS AROUND THE GLOBE



STRUCTURE

- ✘ Family-Paramyxoviridae
- ✘ Genus-Henipavirus

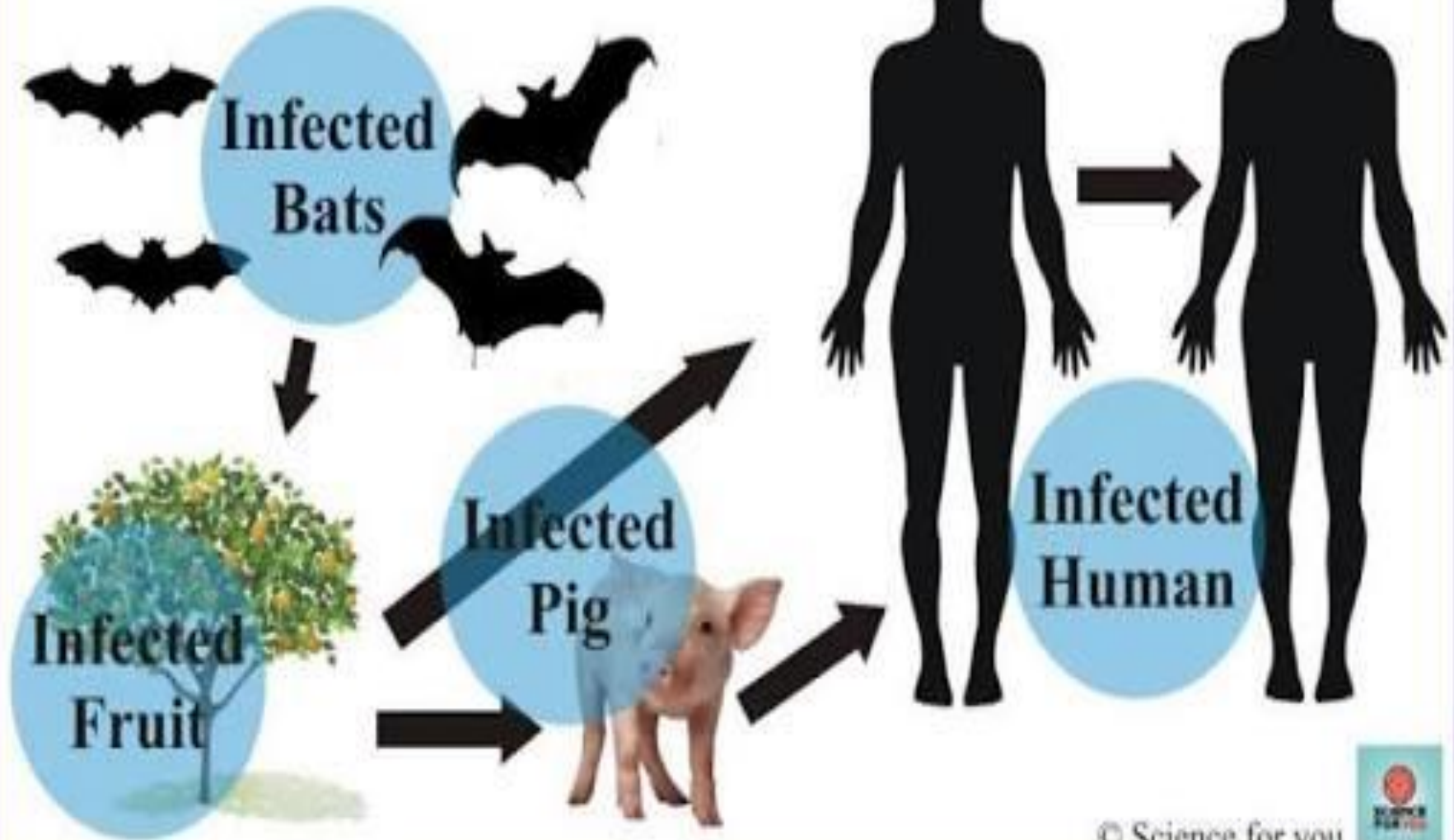


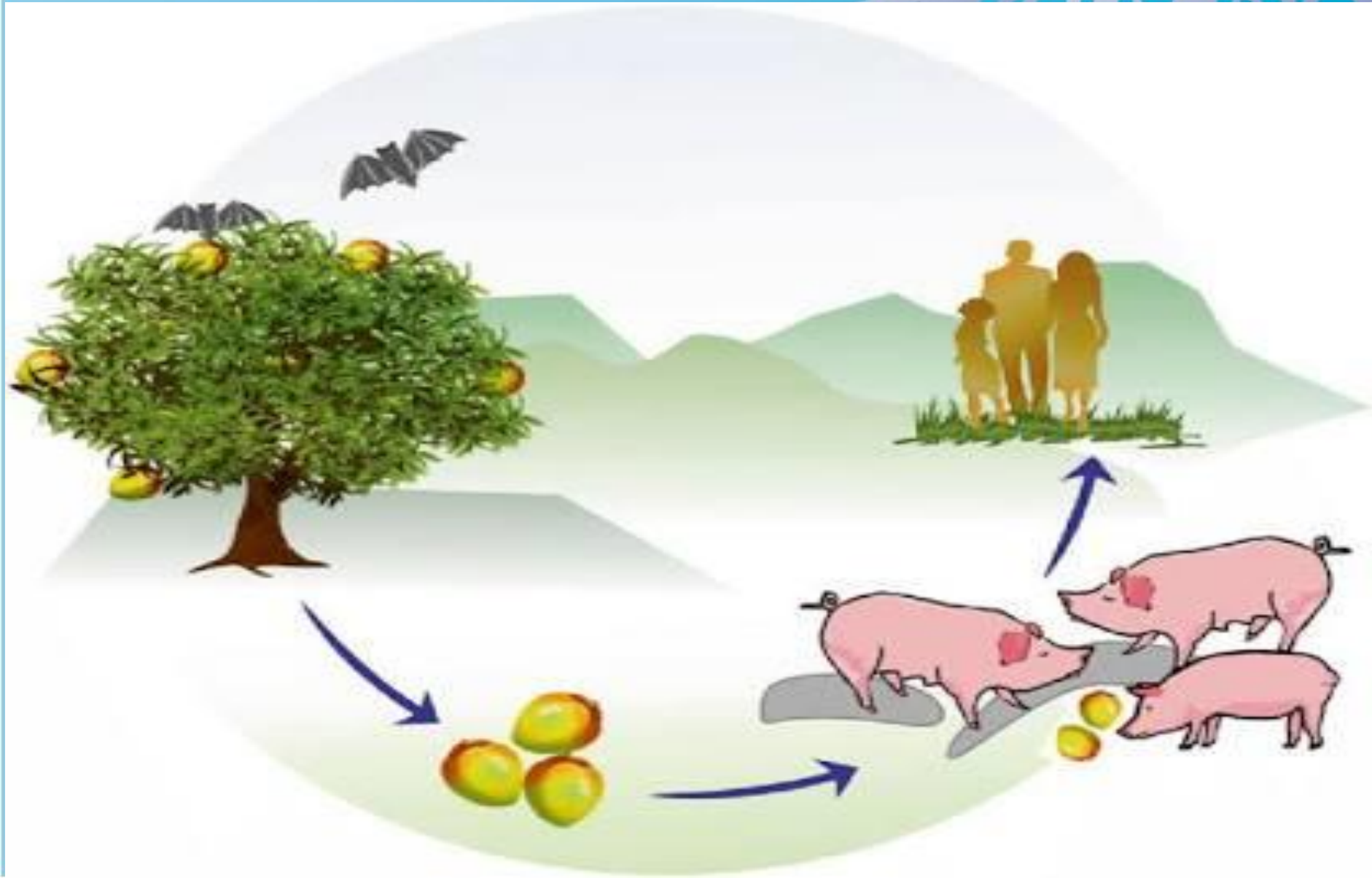


MODE OF TRANSMISSION

- ✘ Food contaminated by infected bats
- ✘ Infected pigs
- ✘ Close contact/ body fluids of infected patients

Transmission of Nipah virus





INCUBATION PERIOD



- ✘ 5 to 14 days
- ✘ May be as long as 40 days

Centers for Disease Control and Prevention (CDC). Update: outbreak of Nipah virus—Malaysia and Singapore, 1999. MMWR Morb Mortal Wkly Rep 1999; 48:335

WHEN TO SUSPECT ?



- ✘ Fever
- ✘ Headache
- ✘ Myalgia
- ✘ Vomiting
- ✘ Altered sensorium
- ✘ Seizures
- ✘ respiratory symptoms
- ✘ Autonomic instability

LABORATORY DIAGNOSIS



- ✘ Early stage-PCR
- ✘ Throat swab, posterior nasal swab
- ✘ Blood, urine, CSF
- ✘ Late stages-Serology

TREATMENT



- ✗ Supportive
- ✗ Ribavirin

Chong HT, Kamarulzaman A, Tan CT, et al. Treatment of acute Nipah encephalitis with ribavirin. *Ann Neurol* 2001; 49:810.

FAVIPIRAVIR

 <https://www.nature.com/articles/s415>



SCIENTIFIC REPORTS

PDF



Article | **OPEN** | Published: 15 May 2018

Favipiravir (T-705) protects against Nipah virus infection in the hamster model

Brian E. Dawes, Birte Kalveram, [...] Alexander N. Freiberg 

MONOCLONAL ANTIBODY - M 102.4



Journal of
Virology

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[J Virol.](#) 2006 Jan; 80(2): 891–899.

doi: [10.1128/JVI.80.2.891-899.2006](https://doi.org/10.1128/JVI.80.2.891-899.2006)

PMCID: [PMC1346873](https://pubmed.ncbi.nlm.nih.gov/PMC1346873/)

PMID: [16378991](https://pubmed.ncbi.nlm.nih.gov/16378991/)

Potent Neutralization of Hendra and Nipah Viruses by Human Monoclonal Antibodies

[Zhongyu Zhu](#),^{1,2} [Antony S. Dimitrov](#),³ [Katharine N. Bossart](#),^{3,†} [Gary Cramer](#),⁴
[Kimberly A. Bishop](#),³ [Vidita Choudhry](#),¹ [Bruce A. Mungall](#),⁴ [Yan-Ru Feng](#),³ [Anil Choudhary](#),³
[Mei-Yun Zhang](#),^{1,2} [Yang Feng](#),¹ [Lin-Fa Wang](#),⁴ [Xiaodong Xiao](#),¹ [Bryan T. Eaton](#),⁴
[Christopher C. Broder](#),^{3,*} and [Dimitar S. Dimitrov](#)^{1,*}

EMERGING INFECTIONS

Remdesivir (GS-5734) protects African green monkeys from Nipah virus challenge

Michael K. Lo¹, Friederike Feldmann², Joy M. Gary¹, Robert Jordan^{3*}, Roy Bannister³, Jacqueline Cronin⁴, Nishi R. Patel¹, John D. Klena¹, Stuart T. Nichol¹, Tomas Cihlar³, Sherif R. Zaki¹, Heinz Feldmann⁴, Christina F. Spiropoulou¹, Emmie de Wit^{4†}

Nipah virus is an emerging pathogen in the *Paramyxoviridae* family. Upon transmission of Nipah virus from its natural reservoir, *Pteropus* spp. fruit bats, to humans, it causes respiratory and neurological disease with a case-fatality rate about 70%. Human-to-human transmission has been observed during Nipah virus outbreaks in Bangladesh and India. A therapeutic treatment for Nipah virus disease is urgently needed. Here, we tested the efficacy of remdesivir (GS-5734), a broad-acting antiviral nucleotide prodrug, against Nipah virus Bangladesh genotype in African green monkeys. Animals were inoculated with a lethal dose of Nipah virus, and a once-daily intravenous remdesivir treatment was initiated 24 hours later and continued for 12 days. Mild respiratory signs were observed in two of four treated animals, whereas all control animals developed severe respiratory disease signs. In contrast to control animals, which all succumbed to the infection, all remdesivir-treated animals survived the lethal challenge, indicating that remdesivir represents a promising antiviral treatment for Nipah virus infection.

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Government Works

EMERGING INFECTIOUS DISEASES®




[Emerg Infect Dis](#). 2019 Jun; 25(6): 1144–1152.

doi: [10.3201/eid2506.181620](https://doi.org/10.3201/eid2506.181620)

PMCID: PMC6537706

PMID: [31107231](https://pubmed.ncbi.nlm.nih.gov/31107231/)

Use of Single-Injection Recombinant Vesicular Stomatitis Virus Vaccine to Protect Nonhuman Primates Against Lethal Nipah Virus Disease


[Chad E. Mire](#), [Joan B. Geisbert](#), [Krystle N. Agans](#), [Krista M. Versteeg](#), [Daniel J. Deer](#), [Benjamin A. Satterfield](#),¹ [Karla A. Fenton](#), and [Thomas W. Geisbert](#)

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Associated Data

▸ [Supplementary Materials](#)

Abstract

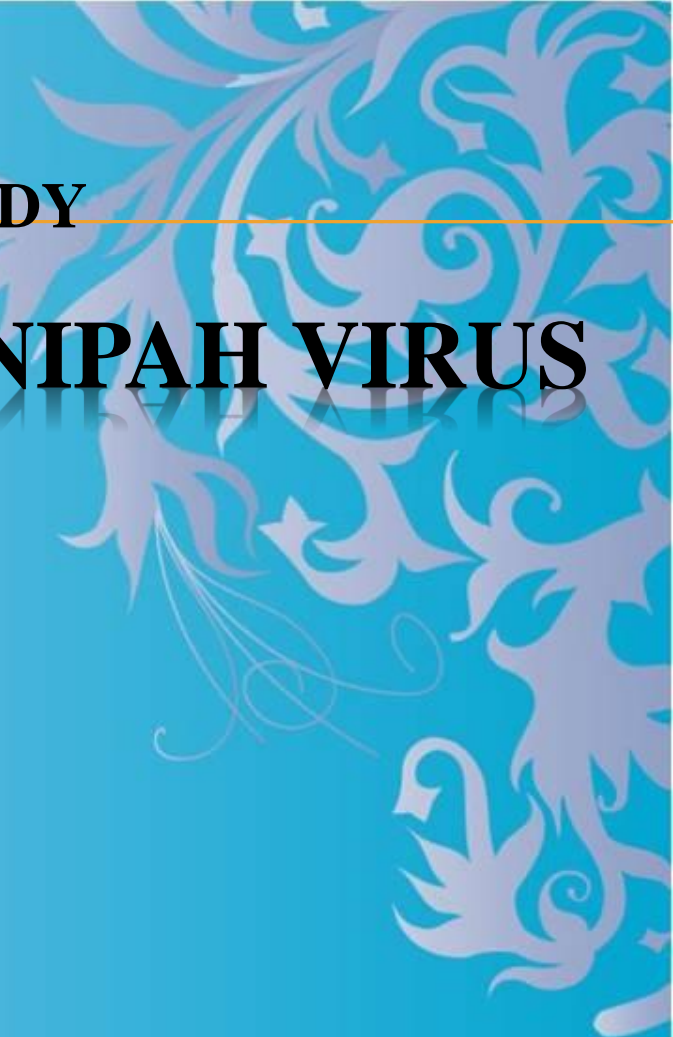
Go to: 

Nipah virus (NiV) is a zoonotic pathogen that causes high case-fatality rates (CFRs) in humans. Two NiV

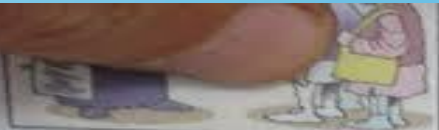
A CALICUT MEDICAL COLLEGE STUDY

CLINICAL PROFILE OF NIPAH VIRUS INFECTION

INFECTION



NIPAH STRIKES CALICUT.....



It's called the 'Suit-Boot' Sarkar.

"Her husband, Tushar Trivedi, and his mother, Chandaben, would stop anyone from saving the woman by saying that people had no right to interfere in their personal matter," a neighbour said. Police

tempting to save her. They said the family had been living in the area for over four years. Punam filed a case against her husband and in-laws after she was rescued at Meghanagar police station. Police have booked the two under section

Nipah virus confirmed in Kerala as toll touches 5

TIMES NEWS NETWORK

Kozhikode: The National Institute of Virology, Pune, has confirmed that the contagious fever that has so far killed five people over the last fortnight is due to Nipah virus (NiV). Of the five deceased, four are from Kozhikode district and one from Malappuram, and they reportedly contracted the zoonotic illness — spread mainly through bats, pigs and other animals and whose symptoms include fever, vomiting, headache and respiratory problems — through close proximity to patients.

Rajeesh Sadanandan, additional chief secretary, department of health & family welfare, told TOI that the virus was confirmed in tests conducted at the Pune institute on samples from a family at Changaroth panchayat. It is the first detection of Nipah virus in Kerala, though there have been two outbreaks of the disease in West Bengal in 2001 and 2007. "We will now treat all persons presenting similar symptoms as

potential Nipah-infected cases as part of disease surveillance," Sadanandan said. A high-level central team will visit the district on May 21.

The toll due to suspected Nipah virus infection rose to five on Sunday with two more persons succumbing to the illness. The deceased have been identified as Ismail, 40, hailing from Kootalida and Velayudan, 48, from Kolathur.

Sadanandan said the department has not been able to ascertain the extent of the spread of the disease as it has an incubation period of four to 18 days.

"As the primary host of Nipah virus is fruit bats, the disease control and containment strategy include asking people to desist from eating bat eaten fruits. Also, the district collector has been asked to stop toddy tapping in the area as toddy can become contaminated with saliva or bat urine. Pigs too can serve as intermediate hosts of the virus and as per reports there are many pig farms in the area and steps have been taken in that regard," Sadanandan said.

FRUIT BATS HOST VIRUS

- Natural host of the Nipah virus (NiV) are fruit bats
- Transmission of NiV to humans may occur after direct contact with infected bats, infected pigs, or from other NiV infected people
- After exposure & incubation period of 5-14 days, illness presents with 3-14 days of fever and headache, followed by drowsiness, disorientation and mental confusion

Source: WHO & Centers for Disease Control and Prevention, US

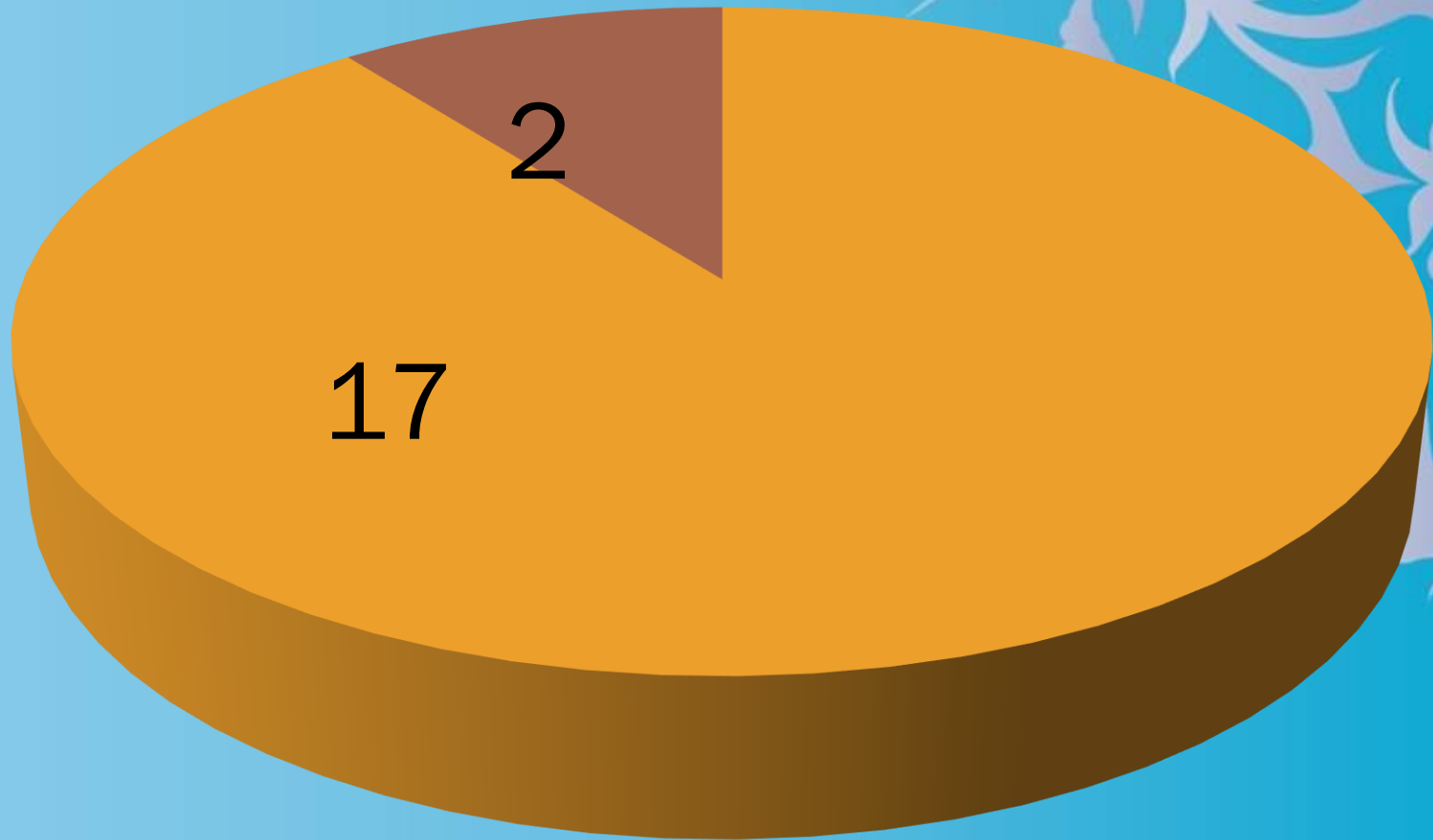


FIRST CASE OF NIPAH



- ✘ Admitted on 5th May, 2018
- ✘ Govt. Medical College, Kozhikode
- ✘ Serologically not confirmed
- ✘ Index case

TOTAL NIPAH CASES

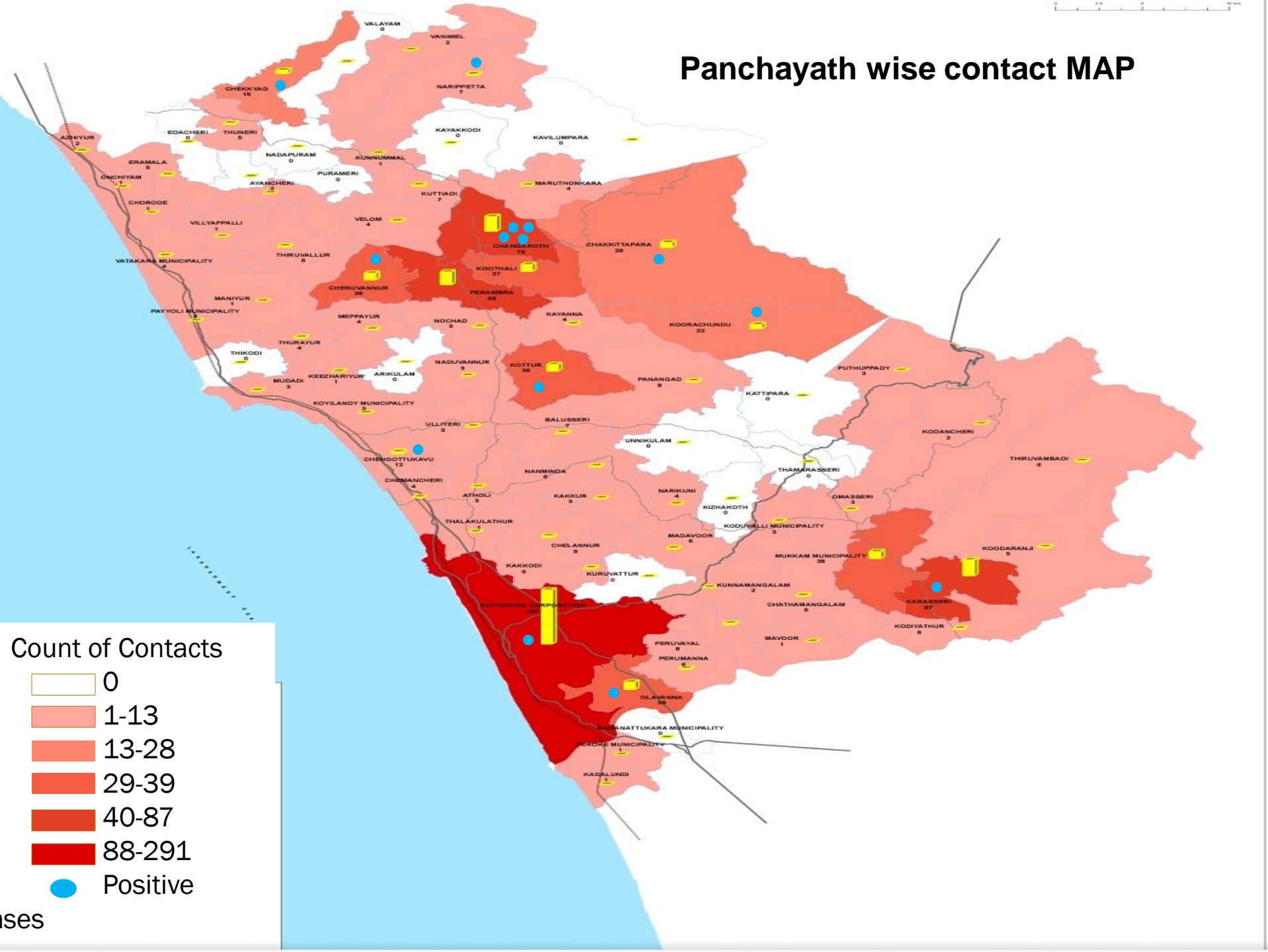


Total Patients- 19

■ Death

■ Survivors

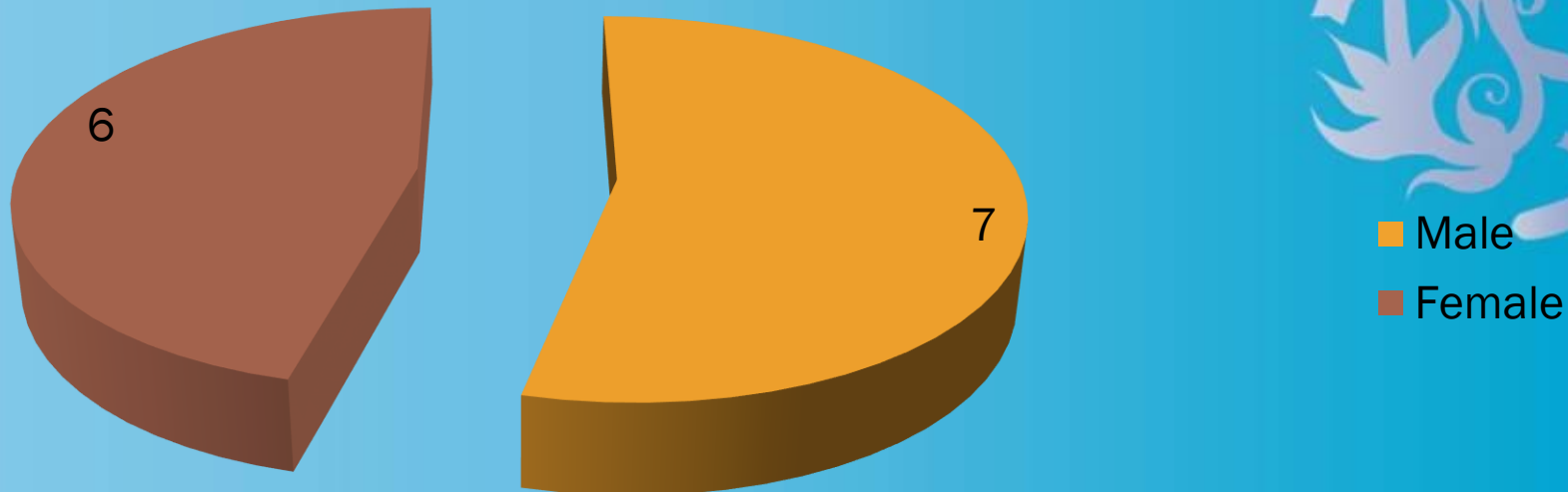
Panchayath wise contact MAP



-
- ✘ 13 cases treated in GMCH, Kozhikode
 - ✘ 6 in two private hospitals
 - ✘ 18 were serologically confirmed

MEDICAL COLLEGE STATISTICS

- ✘ Total cases-13
- ✘ Mean age-36.7 years(range 19 to 75 years)
- ✘ Male female Ratio 1.16

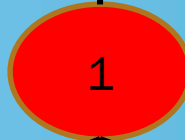


TYPE OF CONTACT

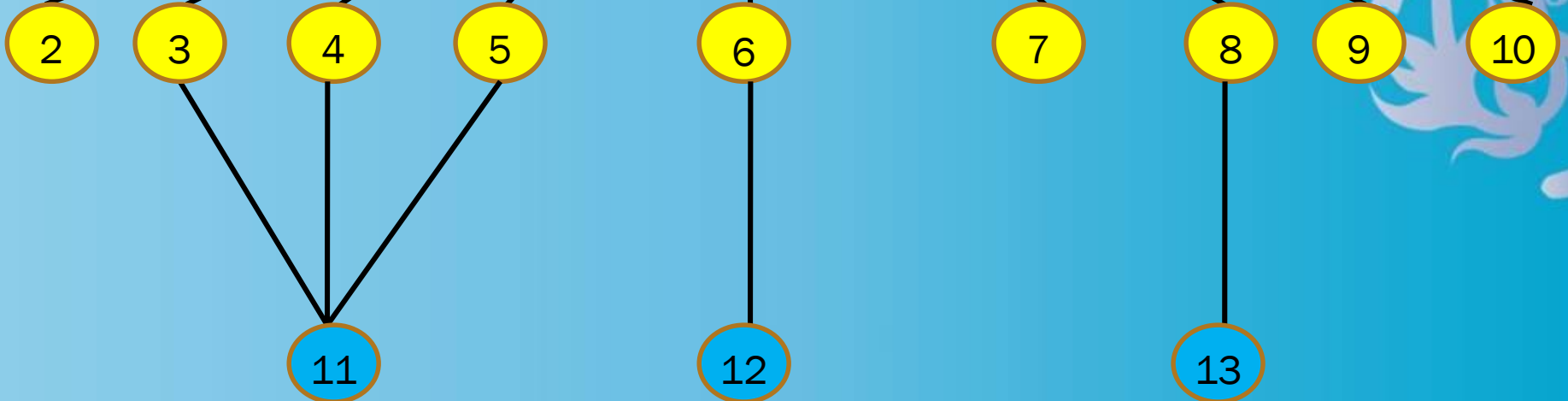




Fruit Bat



Index case



CLINICAL PROFILE



- ✘ Fever-uniformly present in all
- ✘ Mean duration of fever-4.7 days
- ✘ Primary neurologic syndrome-10
- ✘ Primary respiratory syndrome-2
- ✘ Flu like syndrome-1

TABLE 1-SYMPTOMS

| SYMPTOM | NUMBER | PERCENTAGE |
|-------------------|--------|------------|
| FEVER | 13 | 100 |
| HEADACHE | 10 | 76.9 |
| VOMITING | 10 | 76.9 |
| SEIZURES | 3 | 23.1 |
| ALTERED SENSORIUM | 9 | 69.2 |
| MYOCLONIC JERKS | 2 | 15.4 |
| COUGH | 7 | 53.8 |
| DYSPNEA | 12 | 92.3 |
| HEMOPTYSIS | 1 | 7.7 |
| DIARRHEA | 2 | 15.4 |
| ABDOMINAL PAIN | 2 | 15.4 |
| MYALGIA | 9 | 69.2 |
| FATIGUE | 13 | 100 |
| CHEST PAIN | 1 | 7.7 |

TABLE 2-SIGNS

| SIGN | NUMBER | PERCENTAGE |
|--------------------------|--------|------------|
| TACHYCARDIA | 12 | 92.3 |
| TACHYPNEA | 12 | 92.3 |
| PYREXIA | 13 | 100 |
| DYSAUTONOMIA | 2 | 15.4 |
| DELERIUM | 10 | 76.9 |
| MENINGEAL SIGNS | 2 | 15.4 |
| OPHTHALMOPLEGIA | 2 | 15.4 |
| MYOCLONIC JERKS | 2 | 15.4 |
| CHEST CREPITATIONS | 12 | 92.3 |
| CVS THIRD HEART SOUND | 4 | 30.8 |
| ABDOMINAL TENDERNESS | 2 | 15.4 |

INVESTIGATION PROFILE

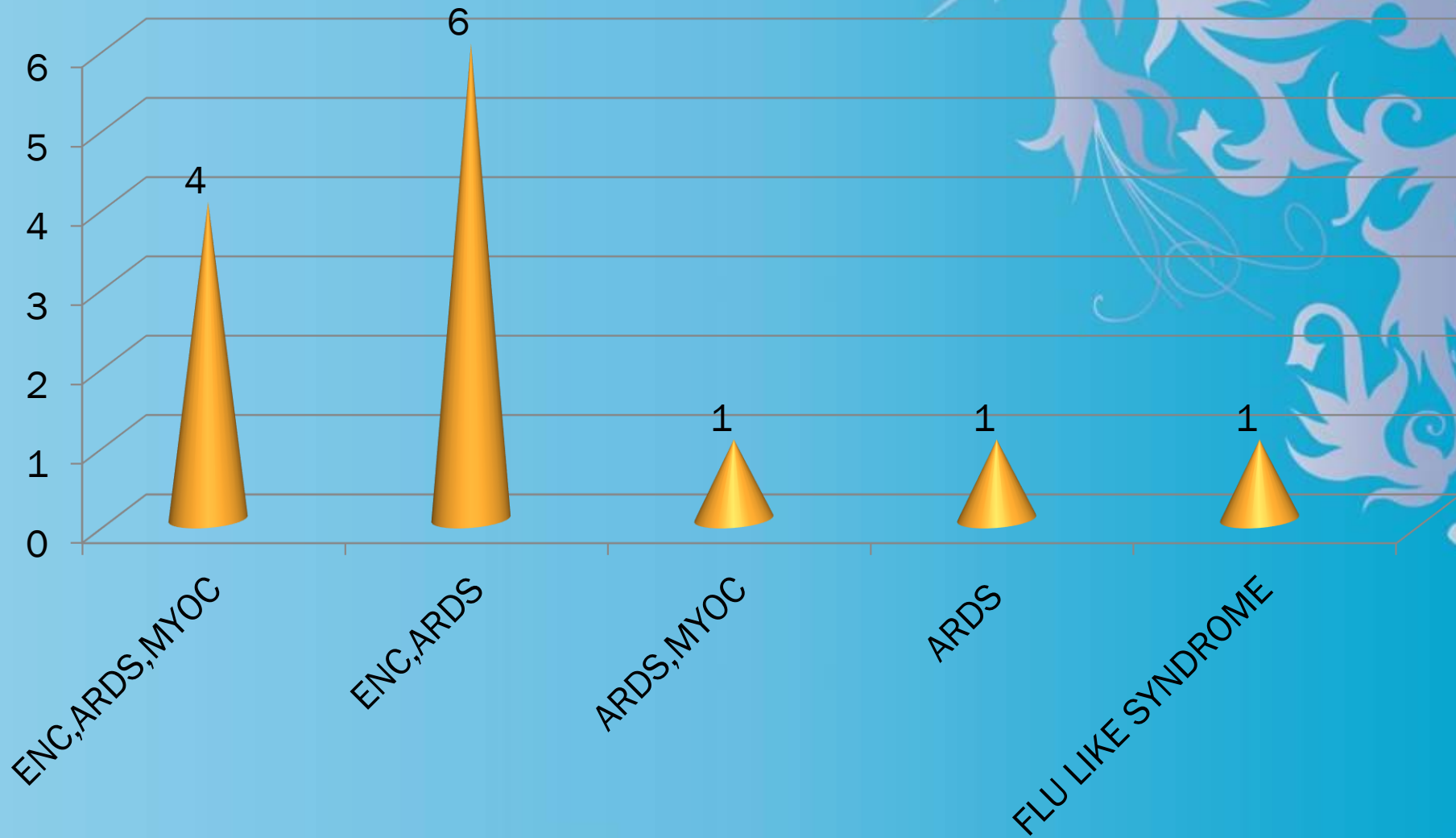
| PARAMETER | MEAN |
|-----------------------|--|
| HEMOGLOBIN | 13.26+/-1.86 (n=12) g/dl |
| TOTAL COUNT | 6300 (1700-9200) cells/mm ³ |
| PLATELET COUNT | 140090(74000-238000) cells/mm³ |
| BLOOD UREA | 44.4(15-118)mg/dl |
| SERUM CREATININE | 1.5 (0.6-4)mg/dl |
| RANDOM BLOOD SUGAR | 137(74-230)mg/dl |
| BILIRUBIN TOTAL | 0.7 (.4-1.2) mg/dl |
| SGPT | 55.4 (10- 259) U |
| SGOT | 93.3 (24-430) U |
| SODIUM | 134meq |
| POTASSIUM | 3.8meq |

ECG CHANGES

- ✘ Sinus tachycardia-9
- ✘ Sinus tachycardia with ST T changes-3
- ✘ Junctional tachycardia-1


-
- ✘ Troponin I-positive in 4(30.8%)
 - ✘ Bedside echo was done only in one patient-global LV hypokinesia
 - ✘ Chest X ray-bilateral fluffy shadows in 8 (61.5%) patients
 - ✘ CT brain-done in 2 patients only-both were normal
 - ✘ Nipah virus detection-positive in 12 patients(MCH, Calicut)
 - ✘ The index case could not be tested for the virus
 - ✘ CSF study-done in 4 patients;one sample showed high protein

PATTERN OF INVOLVEMENT



OUTCOME

- ✘ All patients received supportive treatment
- ✘ Invasive mechanical ventilation-11 (84.6%) patients
- ✘ Non invasive ventilation-one patient
- ✘ Ribavirin was given in 7 (53.8%) patients

-
- ✘ 2 have survived, they are under follow up
 - ✘ No residual illness clinically
 - ✘ Both have received the drug
- 

SURVIVORS

- ✘ Nursing student-DOA-May 19, DOD-June 11
- ✘ Husband of a nipah patient (expired)-DOA-May 21, DOD-June 14

COMPARITIVE STUDY

| Feature | Malasia- Singapore epidemic | Bangladesh - india | Kerala outbreak, india |
|-------------------------|---|--|--|
| Age and occupation | adult pig farm worker | adults, children, health care worker | Adult healthcare worker |
| Spread | Bat to pig, Pig to human | direct bat to human (consumption of date palm juice and fruits contaminated by bats) | Bat to human |
| Transmission | Human to human occassional | human to human spread | human to human spread |
| Respiratory involvement | Malaysian cases(14-29) Singapore- 2 out of 11 had pneumonia without encephalitis | cough (62%) and respiratory difficulty (69%) | respiratory involvement in 92.3%. ARDS as presentation in 2 patients |
| Encephalitis | segmental myoclonus 32-54% | segmental myoclonus not reported | segmental myoclonus 23.1% |
| MRI | disseminated, small high signal intensity lesion | confluent high signal brain lesion in limited MRI | micro infarcts in limited MRI |
| Mortality | 32-41% | 70% | 84.6% |

HOW DID WE MANAGE...?



PATIENT LOAD

- ✘ Kozhikode Government Medical College Hospital northern part of Kerala catering to five districts and a total population of 10,539,636.
- ✘ emergency services 600 patients.
- ✘ OP – 4000 patients per day.
- ✘ The inpatient strength is with 3130 beds .
- ✘ With this high patient turn over cross infection was a big problem.
- ✘ Difficult to cope with the situation immediately.

CALICUT MEDICAL COLLEGE



-
- ✘ On May 20, 2018, when the first case of Nipah was confirmed, an emergency meeting was held by
 - ✘ administrative staff,
 - ✘ Head of the departments &
 - ✘ infection control team
- to discuss regarding the strategies to be implemented to contain the Nipah outbreak.

✘ Strategies



-
- ✘ **Development of infrastructure**
 - ✘ A separate fever triage and ward was set, away from the casualty.
 - ✘ An emergency fever ward was opened near the casualty and patients who required observation or admission were shifted to this ward and cared till a better area was identified.



CASUALTY DUTY STAFF

DATE - 21/05/18
DMO Dr. D. S. S. M.

| UNIT | CHIEF MED | HOURS | NAME |
|----------------|------------------|-------|--------------|
| CMD MEDICINE | (1) Dr. Anand K | 1-4 | Dr. Anand K |
| UNIT CHIEF SLR | (1) Dr. S. S. S. | 2-5 | Dr. S. S. S. |
| CMD SURGERY | (1) Dr. S. S. S. | 3-6 | Dr. S. S. S. |
| UNIT CHIEF | (1) Dr. S. S. S. | 4-7 | Dr. S. S. S. |
| DMO | (1) Dr. S. S. S. | 5-8 | Dr. S. S. S. |
| DMO | (1) Dr. S. S. S. | 6-9 | Dr. S. S. S. |
| UNIT | (1) Dr. S. S. S. | 7-10 | Dr. S. S. S. |
| DMO | (1) Dr. S. S. S. | 8-11 | Dr. S. S. S. |
| UNIT | (1) Dr. S. S. S. | 9-12 | Dr. S. S. S. |
| DMO | (1) Dr. S. S. S. | 10-11 | Dr. S. S. S. |
| UNIT | (1) Dr. S. S. S. | 11-12 | Dr. S. S. S. |

গোপনীয় তথ্য
স্বাস্থ্য

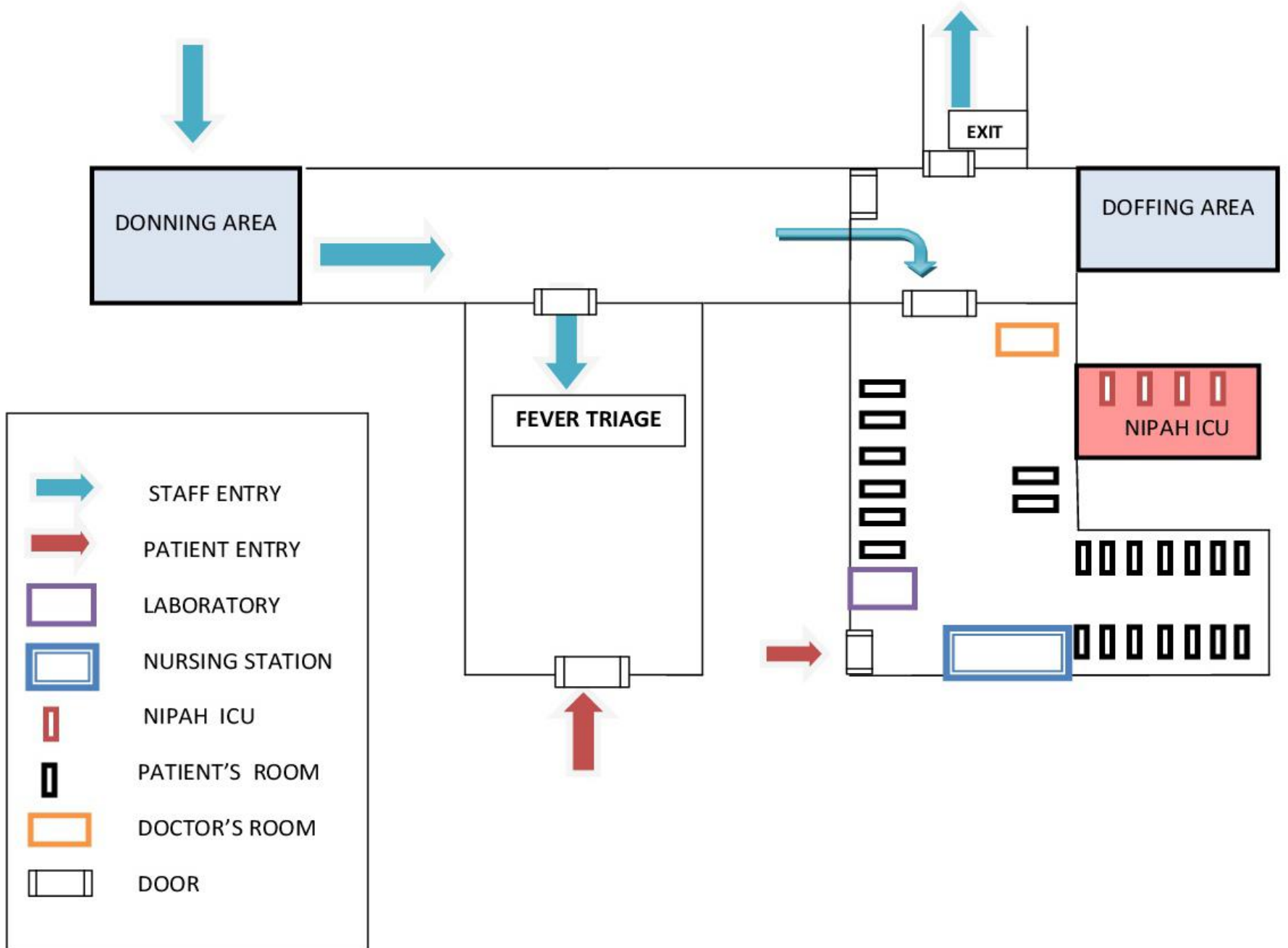
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স্বাস্থ্য সুরক্ষা
স্বাস্থ্য সুরক্ষা

FEVER WARD






-
- ✘ Within 2 days another area, with better infrastructure was identified for isolating Nipah patients which included
 - ✘ separate fever casualty,
 - ✘ intensive care rooms and
 - ✘ rooms for accommodating individual patients







-
- ✘ Infection control board meeting
 - ✘ Separate fever triage
 - ✘ Personal protection equipment
 - ✘ Separate donning and doffing rooms
 - ✘ Govt Medical College, Kozhikode after 1 week-announced as single centre for treatment
- 


ISOLATION WARD

- ✘ Confirmed cases-ICU care
- ✘ Probable cases
- ✘ Contacts
- ✘ 3 layered system



PPE



-
- ✘ Duty of doctors-6 hours
 - ✘ Specimen collection, storage and transport protocol
 - ✘ Separate laboratory
 - ✘ Well structured management protocol
- 





-
- ✘ Daily meetings-morning and evening
 - ✘ Separate committees
 - ✘ Dead body disposal-standard Ebola protocol
 - ✘ Daily classes on infection control

മനം പിടഞ്ഞാലും ഈ മരണഭൂമിയിൽ ഡോക്ടറുണ്ട്

കെ പ്രമനാഥ്

കോഴിക്കോട്

മെഡിക്കൽ കോളേജിലെ നിപാ ഐസൊലേഷൻ വാർഡിൽനിന്നുള്ള ഫോൺ കോളുകൾ വരുമ്പോൾ ഡോ. ആർ എസ് ഗോപകുമാറിന്റെ മനസ്സ് പിടയ്ക്കും. മരണമാവരുതെന്ന ചിന്തയിലാണ് ഫോൺ എടുക്കുക. മരണമായാൽ ഉടൻ അവിടെക്ക് കൂട്ടിക്കൊണ്ടുപോകണമെന്നും ശ്രമശാസ്ത്ര ജീവനക്കാരും ഭയക്കുന്ന, ആ ശരീരം ഏറ്റുവാങ്ങി എല്ലാ ആദരവോടെയും കൂടി സംസ്കരിച്ച ശേഷമേ വിശ്രമിക്കൂ. അവിടെ ജാതിയോ മതമോ ഒന്നും തടസമല്ല. രാപ്പകൽ നീളുന്ന നിസ്വാർഥ സേവനം.

നിപാ വൈറസിനെ നേരിടാൻ കോഴിക്കോട്ട് തുറന്നിട്ടുള്ള സ്പെഷ്യൽ ട്രീറ്റ്മെന്റ് ഫോഴ്സിലെ 11 അംഗങ്ങളിൽ ഒരാളാണ് കോർപറേഷൻ ഹെൽത്ത് ഓഫീസർ കൂടിയായ ഗോപകുമാർ. മരണം സംഭവിച്ചാൽ സുരക്ഷിതമായ രീതിയിൽ മൃതദേഹം അടക്കം ചെയ്യുകയാണ് ചുമതല. ഇതിനകം എട്ട് നിപാ ബാധിതരടക്കം 12 മൃതദേഹങ്ങൾ സംസ്കരിച്ചു. മെഡിക്കൽ കോളേജിൽ നിപാ രോഗികൾക്കടുത്ത് കിടത്തിയതിനാൽ സുരക്ഷിതത്വം കരുതി സംസ്കരിച്ചതാണ് മറ്റ് നാലെണ്ണം. ഇതിൽ



നിപാ ബാധിച്ച് മരിച്ച പേരുന്നയിലെ മുസയുടെ മൃതദേഹം സംസ്കരിക്കാൻ ഡോ. ഗോപകുമാറിന്റെ നേതൃത്വത്തിൽ കണ്ണം പമ്പ് ശ്മശാനത്തിലേക്ക് കൊണ്ടുപോകുന്നു.

തന്നെ രണ്ടെണ്ണം പള്ളിപ്പുറമ്പിലാണ് അടക്കം ചെയ്തത്.

ലോകാരോഗ്യ സംഘടനയുടെ എല്ലാ സുരക്ഷാ മാനദണ്ഡങ്ങളും പാലിച്ചാണ് മൃതദേഹത്തെ സമീപിക്കുന്നതും സംസ്കരിക്കുന്നതും. 200 മൈക്രോൺ കനത്തിൽ ഉയർന്ന ഗുണ

നിലവാരമുള്ള പ്ലാസ്റ്റിക് ഷീറ്റ് ഉപയോഗിച്ച് മൃതദേഹം ആദ്യം രണ്ടുതവണ വായു കടക്കാതെ പൊതിയും. തുടർന്ന് പ്ലാസ്റ്റിക് ബാഗിലേക്ക് മാറ്റും. ഇവ 10 അടി താഴ്ചയിൽ കുഴിയെടുത്താണ് കബർസ്ഥാനിൽ വച്ചത്. മൃതദേഹത്തിനു മേൽ അഞ്ച് കിലോ



ഡോ. ഗോപകുമാർ

ബ്ലിച്ച് ചെയ്ത് പൗഡറും വിതരണം ദഹിപ്പിക്കുന്ന മൃതദേഹമാണെങ്കിലും ഒരുതവണ കട്ടികൂടിയ പ്ലാസ്റ്റിക് ഷീറ്റിൽ പൊതിയും.

ലോകാരോഗ്യ സംഘടന നിഷ്കർഷിക്കുന്ന വ്യക്തിസുരക്ഷാ ഉപകരണങ്ങൾ പൂർണ്ണമായി ധരിച്ചാണ് മൃതദേഹത്തെ സമീപിക്കുന്നത്. പോളി പ്രൊപൈലിൻ പ്ലാസ്റ്റിക് ഉപയോഗിച്ചുള്ള കാലുറ, ഒന്നിന് മേൽ ഒന്നായി ഉപയോഗിക്കുന്ന രണ്ട് കൈയുറ, ശരീരം ഒന്നാകെ പൊതിയുന്ന ബോഡി ബാഗ്, ഇതിന് മുകളിൽ മുഖംമൂടി, പ്രത്യേക തരം കണ്ണട എന്നിവയാണ്. സംസ്കാരചടങ്ങിന് ശേഷം ഹൈഡ്രോ ക്ലോറൈഡ് സൊല്യൂഷൻ പ്രസ്സിലേക്ക് സ്പ്രേ ചെയ്യും. തുടർന്ന് പ്രത്യേകതരം ബാഗിൽ ഇവ നിക്ഷേപിച്ച് കത്തി

ച്ച് കളയുന്നു.

നിപാ ആദ്യം ബാധിച്ച സാബിത്തിന്റെ ബാപ്തമ്യയുടെ കണ്ണം പരമ്പിലെ സംസ്കാരം ലോകമാകെ ശ്രദ്ധിക്കപ്പെട്ടു. ഗോപകുമാറിനൊപ്പം മറ്റ് അഞ്ച് പേർക്കൂടി അടങ്ങുന്നതായിരുന്നു സംഘം. ഇതിൽ ഒരു യുവതികൂടിയുണ്ടായിരുന്നു. പുണെ വൈറോളജി ഇൻസ്റ്റിറ്റ്യൂട്ടിലെ സീനിയർ സയന്റിസ്റ്റ് റിമ സഹായ്. ആഫ്രിക്കയിൽ എബോള വൈറസ് ബാധിച്ച് ആയിരങ്ങൾ മരിച്ചപ്പോൾ അവിടെ പോയി നിരവധി സംസ്കാരങ്ങൾക്ക് നേതൃത്വം കൊടുത്ത അനുഭവസമ്പത്തുണ്ടിവർക്ക് മാവുൾ റോഡ് ശ്മശാന ജീവനക്കാരാണ് മൃതദേഹം തൊടാതെ മാറിനിന്ന ദുഃഖകരമായ അനുഭവമുണ്ടായി ഇതിനിടയിൽ. ഐവർമാത്തിലെ ജീവനക്കാരാണിപ്പോൾ ദഹിപ്പിക്കുന്നത്. 'ഭാര്യ പരിശ്രമിച്ച് നിത്യേന വിളിക്കുന്നുണ്ട്. രണ്ട് കൊച്ചു മക്കളാണുള്ളതെന്ന് ഓർമ്മിപ്പിക്കുന്നു. പക്ഷേ ഇതെന്റെ കടമയായാണ് ഞാൻ കാണുന്നത്. മന്ത്രി ശൈലജയും കലക്ടറും ഹെൽത്ത് ഡയറക്ടറുമെല്ലാം പരഞ്ഞ നല്ല വാക്കുകൾ മാത്രം മതി ജീവിതകാലം മുഴുവൻ എനിക്ക് സന്തോഷിക്കാൻ' ഡോക്ടറുടെ വാക്കുകളിൽ അഭിമാനത്തിന്റെ തിളക്കം.

DAILY EXTENSIVE MEETINGS...

- ✘ 8-9 am—administrative level
- ✘ 3:30-5 pm—administrative + nodal officers + heads of departments
- ✘ 5:30-7 pm-Nipah control cell
 - Collector as Chairman
 - DMO, DHS, health service team & police officers, veterinary
 - Central team from 3rd day onwards
 - Ministers on most of the days-Health, Excise and Transport

EXPERT VISIT

- ✘ **Team A:** NCDC (DR. Ramesh, DR. Raghu. Dr.Rajendran)
- ✘ **Team B:** Pune Virology
- ✘ **Team C:** ICMR (Dr. Abhijit)
- ✘ **Team D:** Manipal Virology (Dr. Arun)
- ✘ **Team E:** AIIMS
- ✘ **Team F:** NIE (Dr. A.P.Sugunan, Dr. P. Manickam, Dr. Tarun Bhatnagar, Dr. Karishma Kurup, Dr. Aarathee Renjith)

ECONOMIC SUPPORT



- ✘ Ministry
- ✘ Voluntary organizations
- ✘ NRI firms
- ✘ Political and religious organizations
- ✘ Medical organizations

CALEFIM



MEDIA

- ✘ Public awareness
- ✘ Decreased panic
- ✘ Facebook, you tube videos



Kerala, Centre join hands to counter Nipah


Four dead, nine persons under observation

STAFF REPORTER
KOZHIKODE

The Kerala and the Central government authorities as well as the medical community have stepped up efforts to contain the threat of a possible outbreak of the Nipah virus infection, which has so far claimed at least four lives in Kozhikode district.

Three persons of a family from Sooppikkada village in the Changaroth grama panchayat limits, near Perambra, Kozhikode, have died so far due to virus encephalitis and myocarditis since May 5. The cause of the death of one has been confirmed as Nipah viral infection.

The latest victim of the virus was a nurse involved in the treatment of the infected persons, who died on Monday. Lini, 31, who was attached to the Perambra taluk hospital, was on duty when



Killer virus | A look at the Nipah virus that has claimed four lives in Kerala and has set off a public health scare

- Nipah virus (NiV) is a paramyxovirus that was first identified after an outbreak that occurred in Malaysia in 1998
- As part of that outbreak, 265 human cases were identified in Malaysia
- Primary mode of NiV transmission is human consumption of bat-contaminated fruits, and subsequently, person-to-person transmission. The natural host of the virus are fruit bats
- Pigs were the intermediate hosts in the outbreaks in Malaysia and Singapore, while in Bangladesh and Singapore, humans were infected as a result of consuming date palm sap that had been contaminated by infected fruit bats
- Both animal-to-human and human-to-human transmission has been documented
- From 1998 to 2015, more than 600 cases of Nipah virus human infections were reported
- Outbreaks include those in Bangladesh and eastern India
- Human-to-human transmission is particularly notable in the outbreaks in India and Bangladesh

Treatment

- As of now, supportive measures for the patients
- No vaccine exists

S Y M P T O M S

Fever | Headache | Vomiting | Dizziness | Altered consciousness - total or partial | Coma | Disorientation/hallucination | Seizures | Respiratory Distress | Cough/Cold

one of the deceased had undergone treatment there. After exhibiting symptoms of the infection, she was placed under treatment at the intensive care unit of the Institute of Chest Diseases of the Government Medical College Hospital, Kozhikode, where

she succumbed. Her body was not handed over to the relatives for fear of spreading the infection and was cremated at the electric crematorium, West Hill, with the consent of the family.

At least nine persons are now under scrutiny for sus-

pected infection.

A team of experts sent in by the Central government arrived in Perambra and Kozhikode and held discussions with governmental authorities at various levels. The team included Sujet K. Singh, Director, National

Diagnosis

- In the early stages of the disease, virus isolation and real time polymerase chain reaction test (RT-PCR) from throat and nasal swabs, cerebrospinal fluid, urine, and blood samples
- Antibody detection by ELISA (IgG and IgM) can be used later on

Preventive measures

- Wash, peel and cook fruits before eating them
- Handwashing at home in order to break the primary infection and transmission of the disease
- Quarantine of those infected has been suggested as it can be highly contagious

from the Union Ministry of Animal Husbandry. The team praised the efforts made by the Health Department to identify the virus and take precautionary steps.

3 nurses hospitalised
Meanwhile, three nurses who initially attended on the virus-afflicted at EMS Memorial Cooperative Hospital, Perambra, has been admitted to the government medical college hospital with fever.

G. Arun Kumar of the Manipal Academy of Virus Research, who visited Changaroth, said the source of the infection might be the bats in a well in the house of the deceased.

The bats were captured with the help of veterinary and wildlife experts and sent for tests. Fruits collected from trees too have been sent for tests.

Mr. Kumar clarified that the infection had not spread in the neighbourhood nor in the community.

Sooppikkada in lockdown

People vacate houses; chicken stalls closed

STAFF REPORTER
CHANGAROTH

The anganwadi at Sooppikkada near here was unusually silent on Monday. The small classroom filled with decorations and cartoon characters was deserted as Changaroth and nearby villages in Kozhikode came to terms with the fatal outbreak of the Nipah viral infection.

"We have come here after convincing our families that the virus does not spread so easily. But what do we do when all 20 students fail to



Safety first: A lottery seller in Kozhikode goes about his work wearing a mask. ■ S. RAMESH KURUP

turn up," asked Kunhaisha, an anganwadi worker, accompanied by helper Sreeja. Three members of a family from Sooppikkada died of

Nipah viral infection followed by the death of a nurse Lini, who was involved in the treatment of the infected persons, at nearby

Chempanoda on Sunday.

A flurry of messages on social media have sparked panic among the local people. "All chicken stalls in the neighbourhood have been closed down as there were rumours that if bats could spread the virus, chickens could too," said one of the villagers who had assembled to watch a team of experts catching bats for testing.

People residing in the vicinity the victims' home are reported have vacated their houses and moved to live with relatives. Almost everybody in Sooppikkada is wearing a surgical mask. Most medical shops in the region have run out of masks.

'Experts' have a field day on social media

STAFF REPORTER
KOZHIKODE

Kerala Health Minister K.K. Shylaja's warning against spreading unscientific messages on the social media against the backdrop of Nipah deaths in Kozhikode district does not seem to have made any impact. Messages and notes, put up by self-proclaimed health practitioners and naturopaths, continue to flood Facebook and WhatsApp.

One video posted on Facebook alleged that efforts were being made by the 'drug mafia' to create panic among the people in the

name of 'a mysterious fever'. "It is being propagated that this infection is spread by a virus and the host is fruit-eating bats. A campaign like this is enough to create hostility against naturopaths who promote fruits as safe diet," the video by a 'naturopath' claims.

Jinesh P.S., a medical professional and admin of Infoclinic Facebook page, which has been in the forefront of the campaign against unscientific medical practices, urged 'naturopaths and acupuncture specialists' to refrain from posting messages that might trigger panic.

Nipah virus claims one more life in Kozhikode

Death toll touches 12; three persons test positive

STAFF REPORTER
KOZHIKODE

The Nipah virus infection claimed one more life in Kozhikode district of Kerala on Thursday, taking the death toll to 12. Tests on samples from another person under treatment at the Government Medical College Hospital (MCH) confirmed the presence of the virus.

The latest victim has been identified as Moosa of Valachuketti house at Sooppikkada village of Changaroth grama panchayat near Perambra. He was undergoing treatment at a private hospital in the city.

His two sons and sister-in-law had earlier succumbed to the infection. His body was buried after religious rites at the Kannamparamba burial ground.

District Collector U.V. Jose said the standard operating procedure was followed during the burial and a 10-ft-



The body of the latest Nipah victim, V. Moosa, being buried by health workers in protective gear at the Kannamparamba burial ground in Kozhikode. • S. RAMESHKURUP

deep pit was dug. Protective gear were provided to those who brought the body from the hospital and to those who helped bury it. Only a few relatives were present.

Meanwhile, authorities at the MCH said they had been administering Ribavirin, an anti-viral drug, to three patients suspected of having Nipah infection. Right now, three people undergoing

treatment had tested positive for the virus. Two of them are at the MCH and one at a private hospital here. There has been a marginal rise in the total number of suspected cases across the State.

According to District Medical Officer V. Jayashree, 29 people have been admitted to various hospitals. Eleven of them are in Kozhikode district, nine in Malappuram

district, four in Ernakulam district, two in Kottayam district, and one each in Wayanad, Thrissur, and Thiruvananthapuram.

Mangaluru cases

Meanwhile, the throat swabs of two patients in Mangaluru sent to the Manipal Centre for Virus Research (MCVR) have tested negative for Nipah.

Nurses allege discrimination by residents

SPECIAL CORRESPONDENT
THIRUVANANTHAPURAM

The Kerala Women's Commission has sought a report from the authorities concerned on the alleged discriminatory behaviour towards nurses at Kozhikode's Perambra taluk hospital and the relatives of those who died of Nipah virus infection.

Such attitude of the local people could only be countered through improved awareness creation, Commission chairperson M.C. Josephine said in her letter to the District Police Chief and the District Medical Officer in Kozhikode.

There were reports that nurses and some of the relatives of the family affected by the infection were being prevented from using public transport by some local people.

Not a major outbreak, says Health Ministry

SPECIAL CORRESPONDENT
NEW DELHI

After reviewing the cases of all the victims of the Nipah virus, the Union Health Ministry's multi-disciplinary central team led by the National Centre for Disease Control (NCDC), presently in Kerala, said the Kozhikode outbreak "is not a major outbreak and is only a local occurrence."

The NCDC team has also further fine-tuned the protocol to deal with the incidence including advisory for healthcare workers, information to the general public, advisories for sample collection and transportation.

A meeting was held with District Collectors, staff of hospitals and the NCDC experts on Thursday to review the condition of patients under treatment at various hospitals and for further ac-

tion to prevent the spread of the disease.

Good awareness

"The efforts taken so far for containment of the disease have been fruitful as the disease has not spread to new areas. The contact tracing strategy adopted has also been successful. It has been found that all the reported cases had direct or indirect contact with the first casualty/his family prior to contacting the disease," a Health Ministry release said.

The Health Ministry said the level of awareness among the public has been encouraging.

"They have been asked to follow safe hygiene practices, not to consume fruits/vegetables partly eaten by birds/animals and take precautionary steps while going near the infected persons/areas."

NIPAH VIRUS OUTBREAK: KERALA NURSE MOVES NATION WITH HER DEDICATION AND SELFLESS SERVICE

Won't see you again, take care of kids: Note of nurse who died treating patients

It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

NOTE READER

A letter, written by a nurse who died while treating patients, was read out at a public meeting in Kerala on Wednesday. The letter was written by a nurse who died while treating patients. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.



GOVT CONFIRMS IT DEATH, IS CRITICAL

The Kerala Health Department confirmed the death of a nurse who died while treating patients. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.



Kerala locks down Sappalokka village

Kerala has locked down Sappalokka village to prevent the spread of Nipah virus. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.



SOCIAL MEDIA DRIVE

We need to work, says Govt... The Kerala government has issued a statement regarding the Nipah virus outbreak. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

WACINATION FOR NIPV?

Experts are discussing the possibility of a vaccine for Nipah virus. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.



We have contained the outbreak effectively

Officials claim that the Nipah virus outbreak has been effectively contained. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.



NEWS FLASH

Pollution, insect excrement are turning Taj yellow & green



AGRA, INDIA'S WHITE MARBLE TEMPLE

4 yrs of NDA, Shah presents BJP's report card

Prime Minister Narendra Modi presented a report card on the NDA government's performance over the last four years. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

12 villages to bypass? Maha Lax Saha says

Union Minister Mahendra Singh Rawat has proposed to bypass 12 villages in the Nipah virus affected area. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

SPORTS TALK

Indian embassy's office in Bhatnagar to shut down

The Indian embassy in Bhatnagar has announced that its office will be shut down. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

WHAT NOW? TALKING POINTS

How in best price spikes protest

Protesters are demanding better prices for agricultural products. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Row over UPSC overhaul plan

There is a row over the UPSC's plan to overhaul its recruitment process. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

TWEET

Supports... A tweet from a user supporting the government's actions. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Submarine Sinking

A submarine sank in the Indian Ocean. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Togadia is looking for Hindus to do cow seva, start Hindu helpline

Former VHP chief is likely to start his organization in Delhi on Thursday



SOCIAL MEDIA DRIVE

Kerala locks down Sappalokka village

Kerala has locked down Sappalokka village to prevent the spread of Nipah virus. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.



What's my blood group?

Man files RTI query... A man has filed a Right to Information (RTI) query regarding his blood group. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Trinamizet Party's tweet has been liked over 600 times

The Trinamizet Party's tweet regarding the Nipah virus outbreak has been widely liked. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Twitter joins the party...

Twitter has joined the party in supporting the government's actions. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Jamia Millia's website hacked for 'Pooja's b'day'

The website of Jamia Millia Islamia was hacked for a birthday celebration. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Twitter reacts...

Twitter users have reacted to the Nipah virus outbreak. It is suggested that I left to death, with the piece of my heart, I have given to the people of Kerala.

Row over UPSC overhaul plan

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NIPAH: LOCAL BATTLE. GLOBAL RECOGNITION

EXPRESS NEWS SERVICE @TPuam

KERALA has received international recognition for its effective prevention measures against Nipah virus outbreak. The Institute of Human Virology in Baltimore honoured Chief Minister Pinarayi Vijayan and Health Minister K K Shylaja for the government's efforts in curbing the outbreak.

Sarangadharan took part in the discussions.

On the occasion, the Chief Minister said Kerala has been taking up healthcare to international standards. He also expressed the state's willingness to associate with the Institute of Human Virology in mutually beneficial research areas.



Institute of Human Virology co-founder Dr Robert C Gallo presents awards to Chief Minister Pinarayi Vijayan and Health Minister K K Shylaja in Baltimore

Noted bio-medical scientist and co-founder of the institute Dr Robert C Gallo presented awards to the Chief Minister and the Health Minister.

Dr Robert Gallo, who was part of the scientific team that discovered the HIV, along with other scientists in the institute held talks with the Kerala delegation.

The team discussed the scope of research association with Kerala in addition to the International Virology Institute proposed to come up in Thiruvananthapuram. Dr M V Pillai and Dr

The state has decided to set up an international ayurveda centre. Once proper scientific research is being carried out in the traditional medicines, this can lead to the production of major medicines. The new ayurveda centre can contribute in this regard.

The Chief Minister said the state was able to provide free treatment to its citizens. As far as health indices are concerned, Kerala has been ranked along with developing countries. The changing lifestyle and new food habits have been posing some challenges in the state's health

sector. The attempt is to find a solution to these issues through the Aardram Mission," he said. He also elaborated on how the state waged a war against the Nipah virus. When the first patient was identified with Nipah, all those who came in contact with him were brought under

strict monitoring. Special guidelines were issued and a coordinated effort by all government machinery was ensured. Special training was given to the medical and paramedical staff. A collective and cautious effort helped reduce the number of casualties, he said.

In addition to the Health Minister, Dr Robert Gallo and Dr Samsundar Kottihil, Director Clinical Virology, IHV, spoke on the occasion. The reception accorded to the Chief Minister and the Health Minister is the biggest recognition that the state has ever received in the health sector. It's for the first time the institute is honouring a people's representative. The globally-acclaimed institution decided to honour the state after detailed analysis on the measures taken by Kerala following Nipah virus attack.

The Chief Minister will return to Kerala after a two-week-long visit to the US, on July 18.



THE SYMPTOMS

After exposure and an incubation period of 5-14 days, illness manifests itself with 3-14 days of fever, headache, acute respiratory syndrome followed by drowsiness, disorientation, mental confusion, seizures and altered sensorium (seat of sensation). Symptoms can progress rapidly, and the patient may go into a coma; it may be fatal within 24-48 hours.

HOW IT SPREADS

Nipah virus (NiV) infection is a zoonotic (a disease transmitted from animals to human beings) disease that can cause severe distress in animals and humans. The natural host of the virus are fruit bats. Virus transmission takes place through direct contact with infected bats, pigs, or from other NiV-infected people through touch or body fluids. Disease can spread from person to person to family members and caregivers of sick individuals.



ON ALERT: Bus passengers in Kozhikode, Kerala, have been given disposable face masks

PRECAUTIONS TO BE TAKEN

- People in affected places should avoid eating or drinking raw date palm sap, a sweet drink popular in winter when it's easy to tap from trees pierced with a spigot. A bat clings to a palm tree as it eats sap just above a collection jar
- Infection can be prevented by avoiding exposure to sick pigs and bats in endemic areas known to be infected
- Use appropriate personal protective equipment devices

STATE YET TO ISSUE ALERT NOTICE IN BORDER DISTRICTS

The state health department on Monday said no communication was received so far from the Centre and hence it had not started surveillance on the virus. Top officials of the health and family welfare department discussed the issue on Monday. "We'll meet on Tuesday too. We may issue an alert notice to Kerala-bordering districts of Mysuru, Mangaluru, Chamarajanagar and Kodagu to be on high alert," said Dr P L Nataraj, director, health and family welfare department.

IMPACT ON HOSPITAL

- ✘ Admission for other illness-negligible
- ✘ Elective surgeries-postponed
- ✘ Uncomplicated deliveries-district and taluk hospitals
- ✘ MBBS students-granted leave
- ✘ Hostels closed
- ✘ University exams postponed
- ✘ Practicals -conducted in other medical colleges

PRE NIPAH WARDS



HOSPITAL DURING OUTBREAK









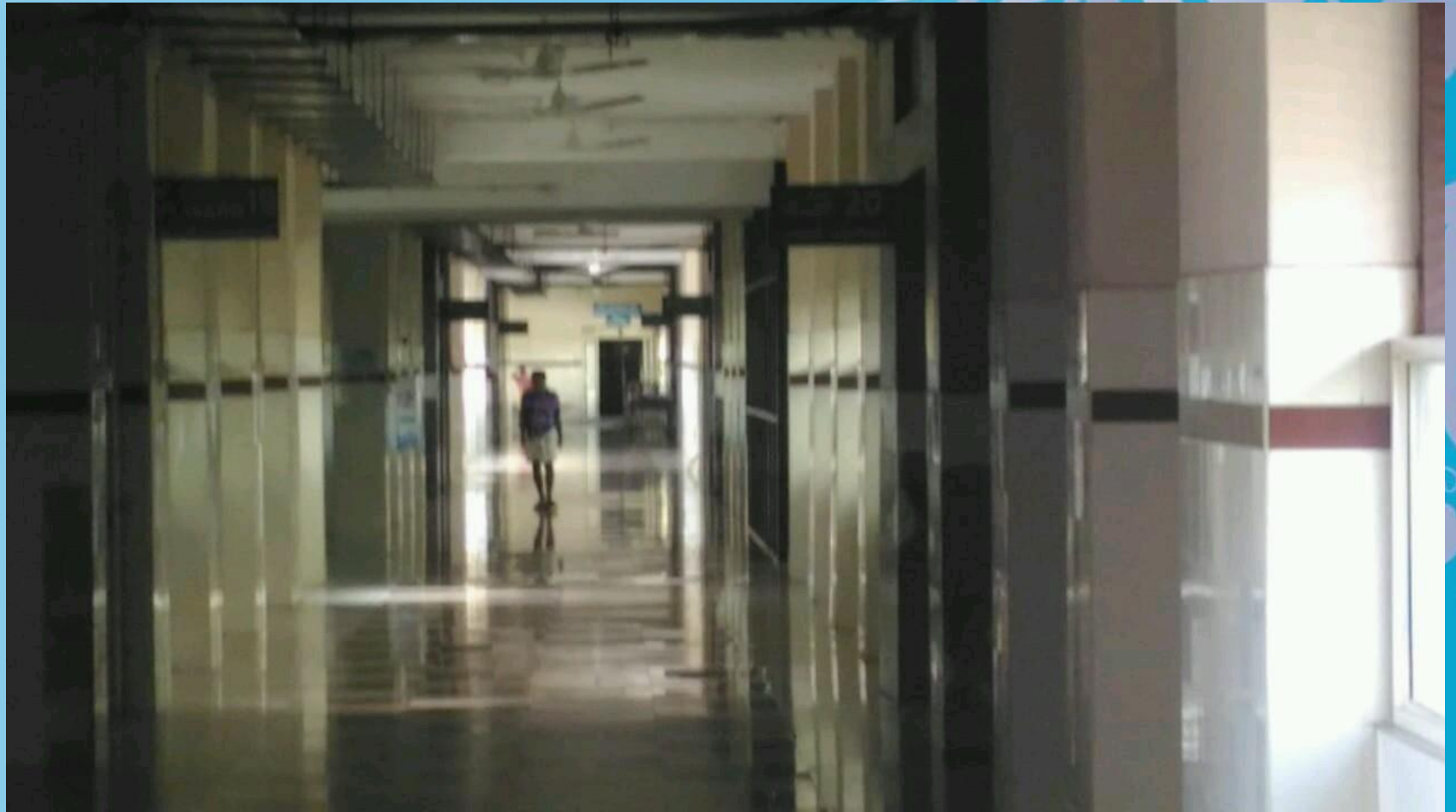
















IMPACT ON PUBLIC



- ✘ Vacant streets
- ✘ Decreased hospital visits & crowd in hospitals
- ✘ Marriage & other public functions postponed
- ✘ Public restricted fruit intake













POST NIPAH....

- ✘ Medical college back to previous state
- ✘ Crowd reappears
- ✘ Fever triage and ward on run





SURVIVORS

- ✘ Two survivors
- ✘ Under close follow up
- ✘ No evidence of residual disease clinically



2ND OUTBREAK IN KERALA

-
- ✘ 23 year old male, studying in a private college in Thodupuzha
 - ✘ Admitted in a private hospital in Kochi with fever.
 - ✘ Clinical suspicion based on some clinical features.
 - ✘ Moved into Isolation and samples sent for NIPAH
 - ✘ JUNE 4th – Official confirmation of NIPAH (NIV Pune)
 - ✘ Immediate and drastic Containment measures.
 - ✘ Health Minister and Health Secretary arranged Video conference.

-
- ✘ 6 member team from Kozhikode Medical College to Government Medical College Ernakulam.
 - ✘ 338 persons – Observation
 - ✘ 17 persons in Isolation
 - ✘ No further positive cases
 - ✘ Patient discharged from hospital on 23rd July 2019 after 54 days of hospital stay.
 - ✘ JULY 23rd – Ernakulam district officially declared nipah free.



We anticipated the recurrence of Nipah, so surveillance was high: Kerala Health Minister

MAITRI PORECHA
New Delhi, June 9
Last week, the scare of Nipah gripped Kerala yet again, a year after the virus claimed 16 lives. The scourge has been better contained this year as the only case, a 23-year-old student, was detected on time and Nipah was contained. In an interview with *BusinessLine*, Kerala's Health Minister KK Shailaja explains how this was achieved. Excerpts:



The Nipah virus claimed 16 lives last year and salvaging the first (Index) case was not possible, but this year the index case of the 23-year-old student was detected on time. How did your team manage that? We anticipated that Nipah could recur this year too. Hence, we kept our surveillance high and took precautions. We tested samples of

each and every fever case for symptoms of cough, sore throat and encephalitis. Among those, the 23-year-old's sample from Kochi turned out to be positive. We at once raised the contact list and quarantined hundreds of suspects. This is how we were able to contain it. The 23-year-old infected patient is a student studying in a polytechnic in Kerala. He went to another place for his training and then he went to his home in Kochi. He developed symptoms at his home which were picked up at the private hospital where he was admitted. After last year's experience, we are conducting a joint effort of government and private hospitals. We got together and discussed protocols affirming that even if any one in the private hospitals comes with symptoms of sore throat, fever, encephal-



There is absolutely nothing to worry about. Test results of all the suspected seven cases were negative
KK SHAILAJA
Health Minister, Kerala

itis etc, they should try and send samples to the National Institute of Virology for testing. Through our experience last year, we furnished protocols and guidelines to act against Nipah. With that experience, we acted swiftly and more scientifically. Last

year, we had contained the virus in a short span of time in a short circle. Yet, out of 18 positive cases, 16 died because of severe infection. As of now, no other person is infected, but I cannot predict what may happen tomorrow. What treatment is being given to the 23-year-old patient? Have you administered monoclonal antibodies that were procured from the Centre? The 23-year-old has regained consciousness, yet has mild fever. We have tried Ribavarin tablets on him. Nipah virus is such that one cannot predict. On some days, the patient shows very good signs of recovery, and suddenly they can become worse. We are hoping to save the 23-year-old. We did collect monoclonal antibodies but we have not given them to the patient. We had collected the medicine for a critical stage,

in case more persons get infected, and show severe symptoms, then we can try the monoclonal antibodies with permission from the Indian Council of Medical Research. How did Nipah make a comeback? Scientists have warned us that there is a possibility that Nipah will recur each year. This is a newly emerging zoonosis. They emerge throughout the globe because of climate change. Nipah can be backtracked up to 30 to 40 years. It first occurred in Malaysia, then Bangladesh, then in India in Siliguri, and last year it was found in Kozhikode. In Malaysia and Bangladesh, the virus was transmitted to pigs and horses and then from animals to human beings. In Kerala, last year it occurred at around the same time as this year. Scientists


are of the view that the natural carrier of Nipah is the fruit-eating bat. The virus is already in their bodies and it is not harmful unless the bats are excited or disturbed and the virus multiplies in their body. If the bats bite the fruits, the virus is transferred onto the fruits through saliva, and if any animal eats that fruit, the virus transfers onto the animal and so on. Is there any message that you would like to give tourists... There is absolutely nothing to worry about. Test results of all the suspected seven cases were negative. We have reopened our schools. I would simply like to say: do not eat fruits bitten by animals or birds. If you are touching something of that sort, please wash your hands with soap as hand hygiene is crucial, and drink only boiled water.

BREAKING NEWS

INDIA TODAY
10:33 AM

KERALA NIPAH SCARE


LAB TESTS CONFIRM THAT 23-YR OLD INFECTED WITH NIPAH



TOP NEWS **THE AN-32 WAS HEADED TO MENCHUKA**

NIPAH SCARE

ERNAKULAM, KERALA



ISOLATION WARDS OPENED

TOP 10 BREAKING

INDIA TODAY
10:34 AM

BREAKING NEWS

കൊച്ചിയിൽ യുവാവിന് നില സ്മിരിക്കരിച്ചു

INDIA NEWS

Nipah: Centre deploys 6-member team to Kerala

Four more suspected cases; antidote from NIV being rushed to Ernakulam

V SAREEV KUMAR
MALYALI PORCEHA
MALYALI@INDIA NEWS 4

After a 23-year-old student was confirmed to have been infected with the Nipah virus in Kerala, State and Central governments have swung the reins to control the re-emergence of the deadly disease.

The official confirmation came on Tuesday morning from the National Institute of Virology (NIV), Pune. Besides the confirmed case, four suspected cases were declared on Tuesday by the State Health Minister, K. Shyaja.

Two of these are nurses: one, a relative of the patient and the other, a friend or acquaintance. The Minister also said that the confirmed patient is stable so far. Nipah can be transmitted from animals to humans. It can also spread through contaminated food and directly from one human to another.

Last year, Nipah had claimed 17 lives in Kerala. A Union Health Ministry official said: "We received the confirmation that the 23-year-old has been infected with Nipah at 3 am on June 4."

Following this, Union Minister of Health Harsh Vardhan held an urgent meeting at his residence with health officials of the Central government to take stock of the situation.

Tracking the virus
The patient had navigated through three districts - Thrissur, Kollam and Ernakulam.

Nipah symptoms include sore throat, muscle pain, fever, vomiting, and breathing difficulties, and patients may enter coma in 24-48 hours, according to the World Health Organisation.

While the virus has no vaccine or drug which works in India, the Director of Indian Council of Medical Research (ICMR) said that monoclonal antibodies have shown to be effective in some cases. "Following last year's cases of Nipah in Kerala, the ICMR had procured 50 batches of monoclonal antibodies (derived from cell lines of immune cells) which are stored at the NIV. These are being shipped to Ernakulam and will reach the district by tomorrow," Bhargava told Businessline.

A central team with six officers has been deployed and it has reached out for epidemiological investigation protocol, contact tracing of suspects, and review of isolation facilities.

"We are finding out where the person was infected, who he was in contact with before landing in a health facility, and whether any of those contacts experienced the symptoms, or if this is an isolated incidence. Also, our control room is active," said Subject Director, National Centre For Disease Control (NCDC).

A team from the NIV is also being dispatched for conducting tests on bats for the potential virus.

The Health Ministry has spoken to the Director General of Forests to extend all cooperation in this regard.

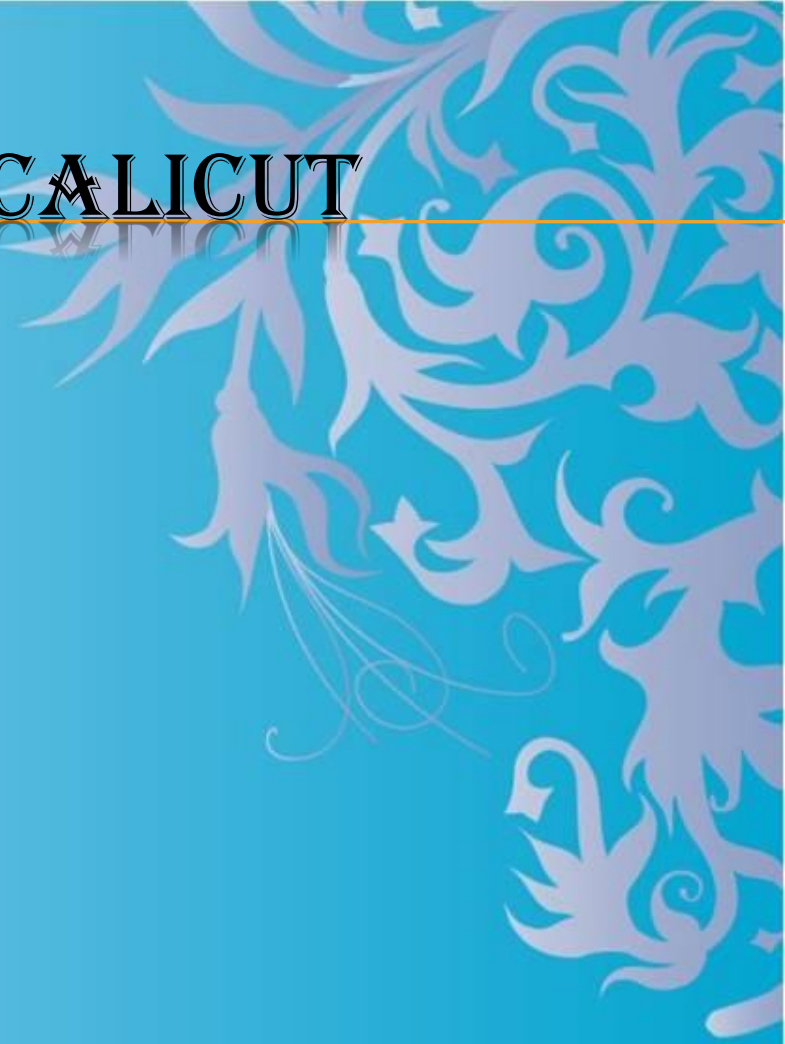
"No need for panic"
Kerala Chief Minister Pinarayi Vijayan said in a Facebook post that there is no reason to panic.

"Our health network is ready to rise up to the challenge. Under the supervision of the Health Minister, all necessary preparations have been taken. We request everyone to follow the instructions of the health department," he said.





NIPAH ARTICLES FROM CALICUT





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ORIGINAL ARTICLE

A Case Series on the Recent Nipah Epidemic in Kerala

NK Thulaseedaran¹, KG Sajeeth Kumar², Jayesk Kumar³, P Geetha³, NV J...

¹ Professor and HOD, Dept. of Medicine, ² Superintendent, ³ Professor, ⁴ Assoc. Prof., ⁵ Address Corresponding Author

Abstract

During May 2018 there occurred an outbreak in Kerala, which started in Soopikkada Village, Changarothu Grama Panchayath in Perambra Taluk, Kozhikode district, of a febrile illness with altered sensorium and ARDS. The diagnosis was made from the second case that it is the dreaded nipah infection. Following that 18 cases tested positive for nipah virus infection of which 2 survived. Also there were four deaths with similar clinical picture but which occurred before the virus was identified. They were considered as probable cases.

Introduction

UPDATE ARTICLE

Nipah Virus Infection

Raveendran AV¹, Shajit Sadanandan², NK Thulaseedharan³, Sajeeth Kumar KG⁴, Bhargavan Pallivalappil⁵, Anoop Kumar AS⁶

Abstract

Nipah Virus Infection is an emerging zoonotic infection which presents with acute encephalitis and respiratory distress syndrome. It is associated with high mortality and classified as Biosafety level 4 organisms in view of its features which make it a potential agent for Bioterrorism. Experience with broad spectrum antiviral agent Ribavirin is promising in reducing the mortality and morbidity

Introduction

Nipah virus infection is an emerging zoonotic disease associated with high mortality rate in human being which varies from 40% to 100%. It presents with predominant respiratory and neurologic features. Recently there was an outbreak in Perambra, Calicut district of Kerala, India. In this article we review common clinical features of Nipah virus infection and its management aspects.

Epidemiology

The first human outbreak of Nipah virus was reported from Malaysia among pig farmers in 1998 which was associated with 40% case fatality rate. The virus was named nipah after the name of the village of "Sungai Nipah", in Malaysia, where it was first identified. Singapore outbreak in 1991 was associated with 9% mortality, whereas

2001 outbreak in Siliguri district of West Bengal was associated with 74% mortality. There are several outbreaks in Bangladesh and the first reported outbreak was in 2001 and it has become an epidemic in Bangladesh. Majority of cases are in the northern-central districts of Bangladesh where date palm sap collection is common and the area is referred as "Nipah belt". 2007 outbreak in Nadia district, West Bengal, India was associated with 100% case fatality. Nipah virus Infection, which is fatal zoonotic infection, has got many features that make it a potential agent for Bioterrorism and is classified as Biosafety level 4 organisms.

In the recent outbreak (2018 may) in Perambra, Kerala, India patients developed both neurological and respiratory symptoms and there was high human to human transmission. Most appreciable fact about the Kerala outbreak was that the team of

doctors were able to identify the virus infection in itself, compared to other viruses where it took more time to identify the causative organism. In the recent nipah outbreak in Kerala, the team implemented preventive measures

Nipah Virus

Nipah virus belongs to the genus of paramyxovirus, which is closely related to the Cedar virus. The virus having nested membrane strands non segmented. It is inactivated by heat, formalin, disinfectants and alcohol, ether and

Natural host

Fruit bats of the order Pteropodidae are the natural host for Nipah virus. The virus is migratory. The virus is asymptomatic in fruit bats which belong to the order pteropodidae, genus pteropodidae, genus pteropodidae, genus pteropodidae. It is hypothesized that the distribution of the virus is with that of pteropodidae.

Nipah virus outbreak in Kerala, India was associated with domestic animals like sheep, cat and dog during the Malabar outbreak in 1999. Pigs can be



Article Navigation

ACCEPTED MANUSCRIPT

Persistence of Nipah virus RNA in semen of survivor

Govindakarnavar Arunkumar ✉,
Jazeel Abdulmajeed, Santhosha Devadiga,
Aswathyraj Sushama, Robin Sam,
Anup Jayaram, Chandni Radhakrishnan,
Kumar K G Sajeeth, K Sakeena,
Jayasree Vasudevan, Joseph K Reena,
Lohitakshan R Sarita

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Published: 22 December 2018

Article history ▼

Adaptive Immune Responses in Humans During Nipah Virus Acute and Convalescent Phases of Infection

Govindakarnavar Arunkumar,¹ Santhosha Devadiga,¹ Anita K. McElroy,^{2,3} Suresh Prabhu,¹ Shahin Sheik,¹ Jazeel Abdulmajeed,¹ Sudandiradas Robin,¹ Aswathyraj Sushama,¹ Anup Jayaram,¹ Sudheesh Nittur,¹ Mohammed Shakir,¹ Keeriyatt Govindan Sajeeth Kumar,⁴ Chandni Radhakrishnan,⁴ Karayil Sakeena,⁵ Jayasree Vasudevan,⁵ Kalathil Joseph Reena,⁵ Ragini Lohithakshan Sarita,⁵ John D. Klena,² Christina F. Spiropoulou,² Kayla F. Laserson,² and Stuart T. Nichol²

¹Manipal Centre for Virus Research, Manipal Academy of Higher Education, Karnataka, India; ²Centers for Disease Control and Prevention, Atlanta, Georgia; ³Department of Pediatrics, University of Pittsburgh, Pennsylvania; and ⁴Government Medical College, Kozhikode, Kerala, and ⁵Directorate of Health Services, Government of Kerala, Thiruvananthapuram, India

Background. Nipah virus (NiV) is 1 of 10 potential causes of imminent public health emergencies of international concern. We investigated the NiV outbreak that occurred in May 2018 in Kerala, India. Here we describe the longitudinal characteristics of cell-mediated and humoral immune responses to NiV infection during the acute and convalescent phases in 2 human survivors.

Methods. Serial blood samples were obtained from the only 2 survivors of the NiV outbreak in Kerala. We used flow cytometry to determine the absolute T-lymphocyte and B-lymphocyte counts and the phenotypes of both T and B cells. We also detected and quantitated the humoral immune response to NiV by virus-specific immunoglobulin M (IgM) and immunoglobulin G (IgG) enzyme-linked immunosorbent assay.

Outbreak Investigation of Nipah Virus Disease in Kerala, India, 2018

Govindakarnavar Arunkumar,^{1,2,3} Radhakrishnan Chandni,^{3,4} Devendra T. Mourya,^{1,5} Sujeet K. Singh,^{6,7} Rajeev Sadanandan,³ Preeti Sudan,⁶ and Balram Bhargava¹; on behalf of the Nipah Investigators People and Health Study Group^a

¹Department of Health Research, Ministry of Health and Family Welfare, Government of India, ²Department of Health and Family Welfare, Ministry of Health and Family Welfare, Government of India, ³Department of Health and Family Welfare, Government of Kerala, India, ⁴Manipal Centre for Virus Research, Manipal Academy of Higher Education (Deemed to be University), Manipal, Karnataka, India, ⁵Department of Emergency Medicine, Government Medical College, Kozhikode, Kerala, India, ⁶National Institute of Virology, Pune, Maharashtra, India, and ⁷National Centre for Disease Control, Delhi, India

(See the Editor Commentary by Spiropoulou on pages 1855–7.)

Background. Nipah Virus (NiV) is a highly fatal emerging zoonotic virus and a potential threat to global health security. Here we describe the characteristics of the NiV outbreak that occurred in Kerala, India, during May–June 2018.

Methods. We used real-time reverse transcription polymerase chain reaction analysis of throat swab, blood, urine, and cerebrospinal fluid specimens to detect NiV. Further, the viral genome was sequenced and subjected to phylogenetic analysis. We conducted an epidemiologic investigation to describe the outbreak and elucidate the dynamics of NiV transmission.

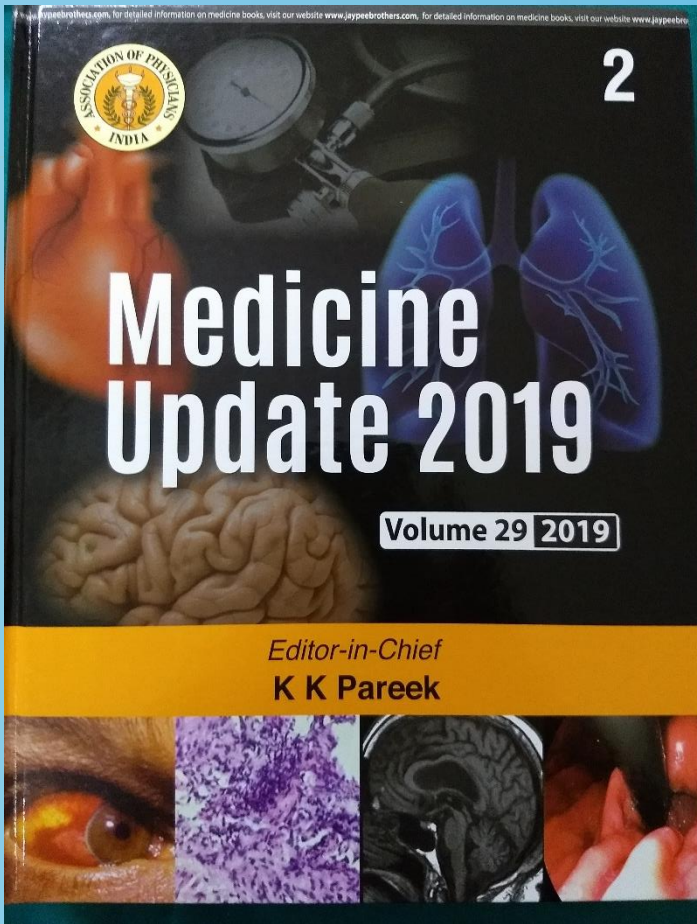
Results. During 2–29 May 2018, 23 cases were identified, including the index case; 18 were laboratory confirmed. The lineage of the NiV responsible for this outbreak was closer to the Bangladesh lineage. The median age of cases was 45 years; the sex of 15 (65%)

In conclusion, we have reported an outbreak of NVD in South India that had extensive nosocomial transmission. We have also provided a detailed description of transmission events that shed light on NiV nosocomial transmission. Early laboratory confirmation and an immediate public health response contained the outbreak. To institutionalize this success, we should promote early detection and response to outbreaks, a culture of laboratory confirmation, including access to apex laboratories, and improvement of infection control practices.

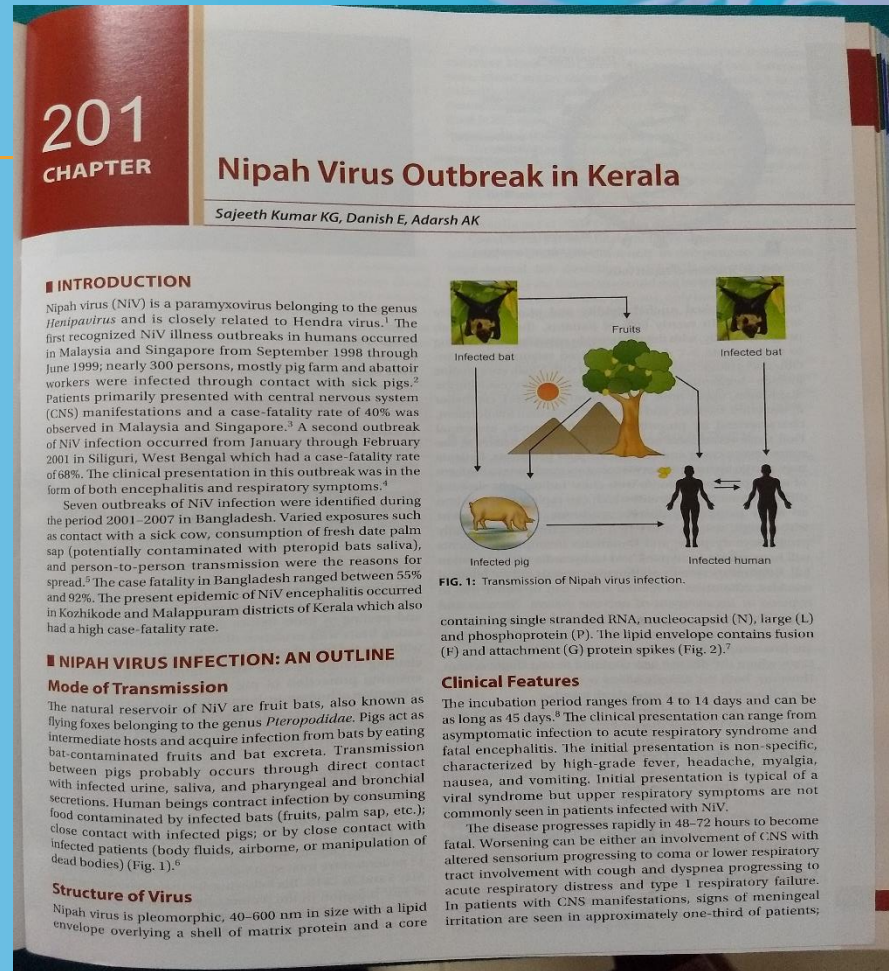
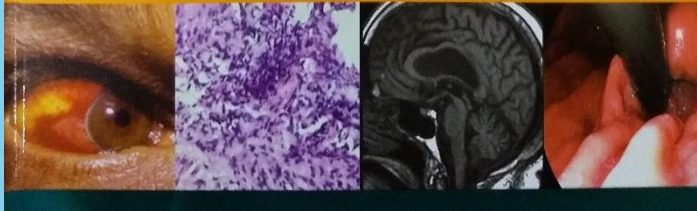
STUDY GROUP MEMBERS

Members of the Nipah Investigators People and Health study group are as follows: Raman R. Gangakhedkar, DCH, MPH, Nivedita Gupta, MBBS, PhD, and Balram Bhargava, MD, DM, FRCP (Indian Council of Medical Research), D. T. Mourya, PhD Pragya D. Yadav, PhD, Anita M. Shete, PhD, Reema Sahay, MD, A. Sudeep, PhD, and Sumit Bharadwaj, MD

Seethu Ponnuthambi, MBBS, M. P. Lilabi, MD, Thomas Bina, MD, Radhakrishnan Chandni, MD, K. G. Sajeeth Kumar, MD, PhD, and V. R. Rajendran, MD (Government Medical College, Kozhikode, Kerala), R. S. Gopakumar, MBBS (Health Officer, Kozhikode Corporation), C. J. Michael, MBBS, DLO (Government General Hospital, Kozhikode, India), P. S. Indu, MD (Government Medical College, Thiruvananthapuram, Kerala), A. C. Mohandas, MVSc (Directorate of Animal Husbandry, Government of Kerala), Arun Zachariah, MVSc PhD (Kerala Veterinary and Animal Sciences University, Wayanad), and U. V. Jose, BE, IAS, and Amit Meena, IAS (District Administration of Kozhikode and Malappuram), Government of Kerala; N. Devadasan, MD, PhD (Institute of Public Health, Bengaluru, India); A. S. Anoop Kumar, MD (Baby Memorial Hospital, Kozhikode, Kerala, India); and Abdul Ghafur, MD, MRCPath (Apollo Hospitals, Chennai, India).



Editor-in-Chief
K K Pareek



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NIPAH SHORT FILM FROM CMC





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- ✘ <https://www.bing.com/videos/search?q=nipah+short+film+nirmal+palazhi&view=detail&mid=CB4332C49282950BA679CB4332C49282950BA679&FORM=VIRE>

VIRUS-MOVIE INAUGURATION



KUNCHACKO
BOBAN

TOVINO
THOMAS

REVATHY

RAHMAN

INDRAJITH
SUKUMARAN

PARVATHY
THIRUVOTH

RIMA
KALLINGAL

ASIF
ALI

INDRANS

SOUBIN
SHAHIR

POORNIMA
INDRAJITH

REMYA
NAMBEESAN

SREENATH
BHASI

MADONNA
SEBASTIAN

JOJU
GEORGE

DILEESH
POTHAN

SENTHIL
KRISHNA

SHARAFUDHEEN

RIMA KALLINGAL PRESENTS

മരണമു

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PRODUCED BY AASHIQ ABU, RIMA KALLINGAL WRITTEN BY MUHSIN PARARI, SHARFU, SUHAS DOP RAJEEV RAVI
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TAKE HOME....

- ✘ Nipah-definitely a deadly infection
- ✘ However, could decrease the spread of infection
- ✘ Combined effort of all
- ✘ Outbreak-contained in the minimum time period and least number of fatalities



DEPT OF MEDICINE



SHE SACRIFICED HER
OWN LIFE FOR SAVING A LIFE
GREAT RESPECT TO YOU



**MAY HER SOUL
REST IN PEACE**

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MY SINCERE THANKS TO..

- ✘ Dept of Medicine-HOD, Staff, Residents, Interns
- ✘ Staff-Nursing and paramedical
- ✘ Principal, GMCH, Kozhikode
- ✘ Dr Sreejith R, Dr Danish E, Dr Adarsh A K

-
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THANK YOU.....

