Nipah encephalitis: The learnings from Kerala

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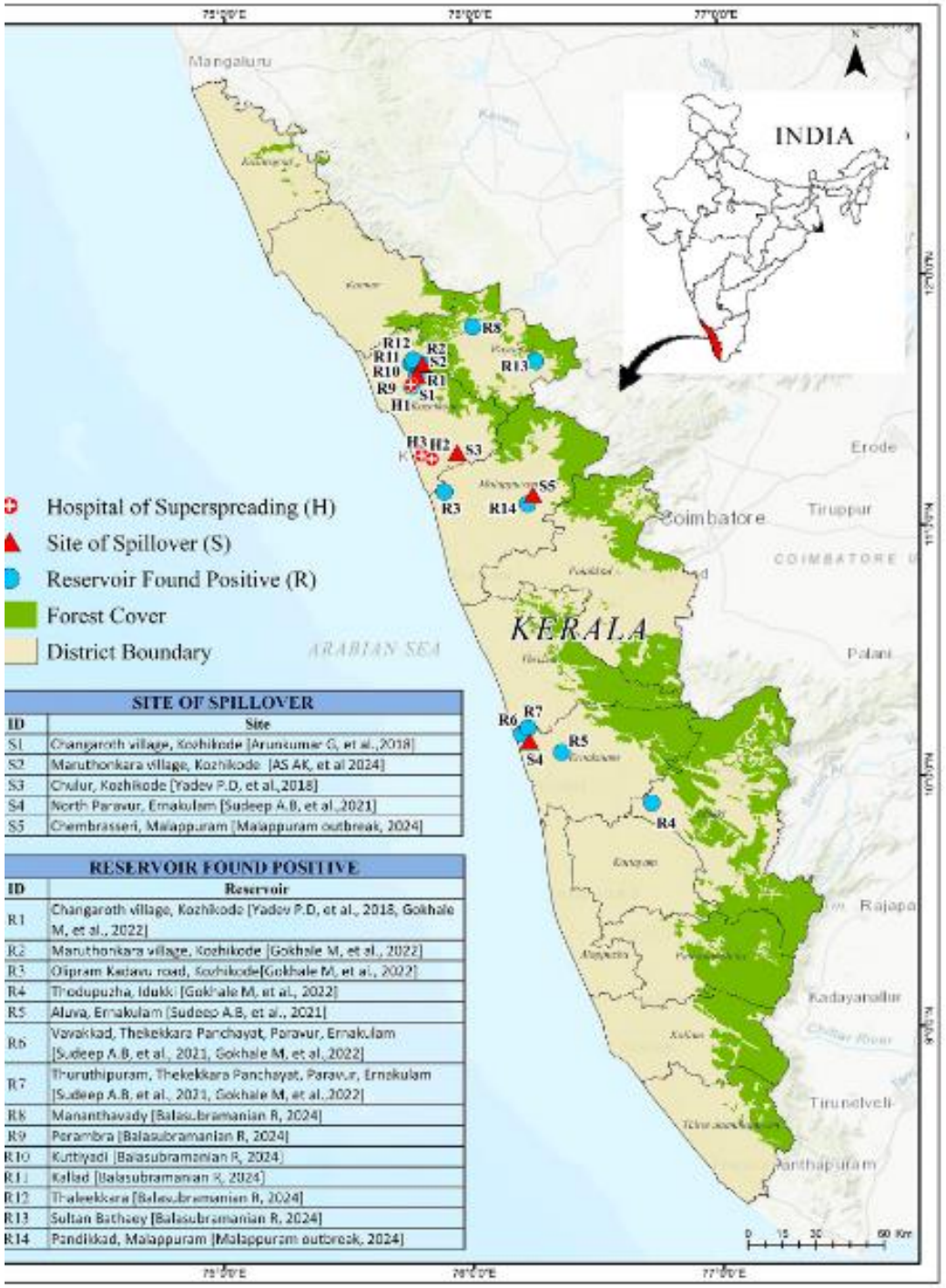
NiV outbreaks and spillovers in Kerala

- Kerala witnessed 10 Nipah virus (NiV) spillovers since 2018
- Two turned out to be outbreaks
  - May 2018 led to 23 (18 confirmed and five probable) infections, of which all except two persons died.
  - September 2023 with six cases, four survived.
- Eight spillover events [2019, 2021, 2024 (2), 2025 (4)] limited to single cases, three survived



Why Nipah encephalitis is a concern

Potential for big outbreaks and even a pandemic

- Universality of reservoir host
- Multiple host tropism
- Superspreading

Mortality and clinical sequelae

Other concerns

- Hospital based superspreading
- Occupational risk of health care workers
- Psychosocial impact and stigma
- Economic impact of the outbreak

PLOS GLOBAL PUBLIC HEALTH

REVIEW

Pandemic potential of the Nipah virus and public health strategies adopted during outbreaks: Lessons from Kerala, India

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Key learnings

1. Destroying bat habitats or scaring them with noise triggers migration and increases human-bat interactions, paradoxically raising the risk of Nipah virus spillover.

Key leanings

2. Active AES (Acute Encephalitis Syndrome) surveillance and PCR/NAT-based diagnosis will save lives and contain Nipah outbreaks.
   - Saving lives by treating patients early
   - Giving chemoprophylaxis to high-risk contacts
   - Containing the outbreak by stopping the transmission

Chemoprophylaxis and Treatment

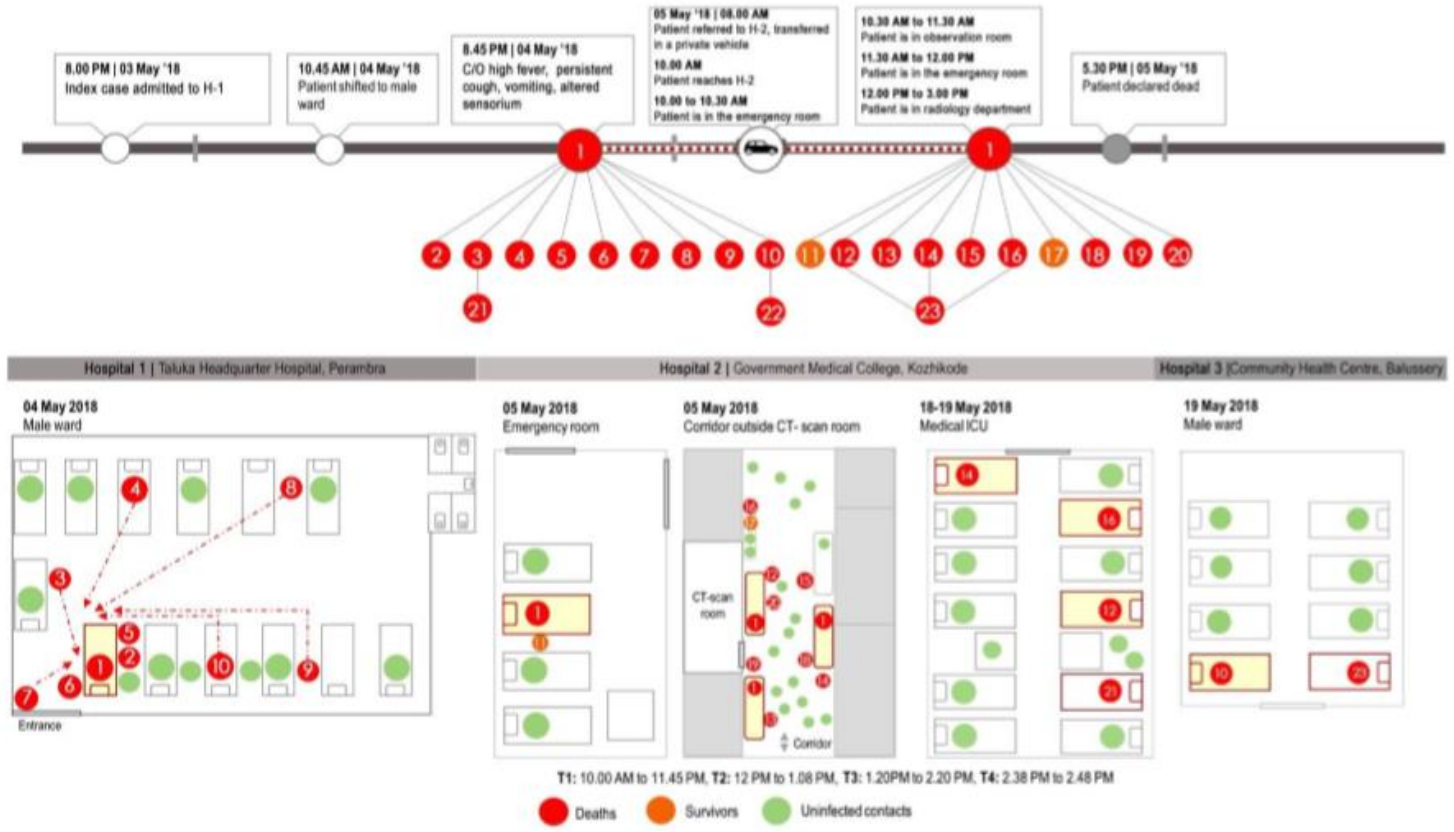
- Nipah treatment guideline of Kerala advise prophylactic Remdesivir (200mg loading, then 100mg daily for 12 days) and Favipiravir (1800mg BID loading, then 800mg BID for 13 days) for high-risk contacts.
- M102.4 monoclonal antibodies (mAb) is also used in treatment

Attribute	Frequency	Percentage (%)
CFR among patients who did not receive any anti-viral medication	18/18	100.00%
CFR among patients received some anti-viral treatment	12/21	57.14%
CFR among patients received Ribavirin	6/11	54.54%
CFR among patients received Remdesivir	0/5	0.0%
CFR among patients received MAB	0/2	0.0%

Key learnings

3. Hospital-based superspreading, particularly from primary cases, drives the Nipah outbreak.

Figure 4



Key learnings

4. Superspreading potential of a non-isolated primary case with respiratory symptoms (ARDS) is very high

Attribute	Frequency	Percentage (%)/ Mean (Range)
Reproduction number of primary cases	25/10	2.5 (0-20)
Reproduction number of secondary/tertiary cases	2/27	0·07 (0-1)
Re of primary cases without respiratory symptoms	0/5	0.00%
Reproduction number of non-isolated primary cases with respiratory symptoms	27/2	13·50 (0-20)
Reproduction number of isolated primary cases with respiratory symptoms	0/3	0.00

Key learnings

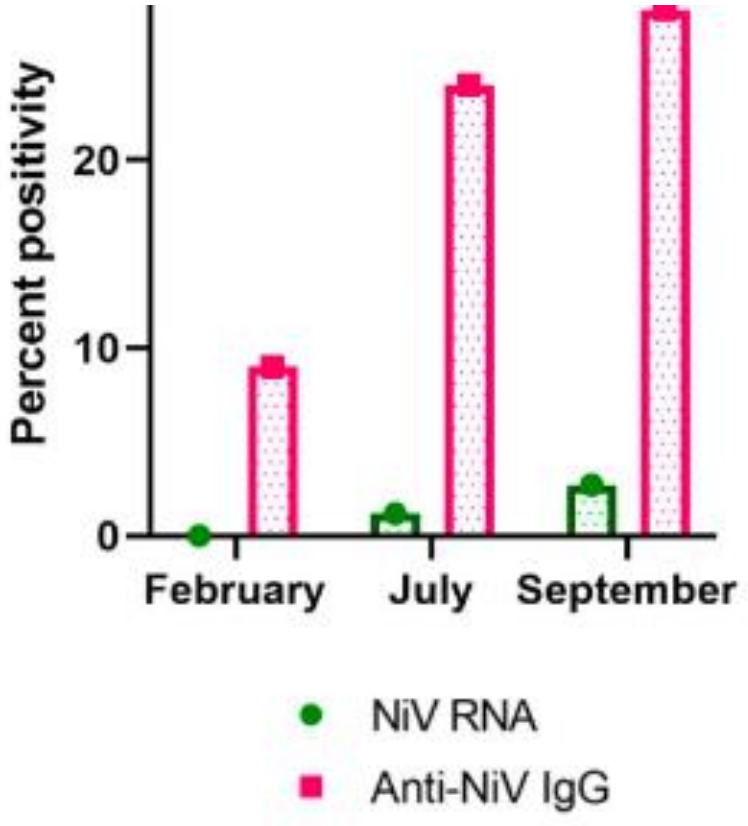
5. Detailed review of CCTV footage from superspreading events indicates that certain individuals remained uninfected despite high-risk, unprotected interactions with primary cases.

Key learnings

6. Consistent mask-wearing prevented transmission among healthcare workers, with no recorded cases in those who maintained respiratory protection

Key learnings

7. Nipah spillovers in Kerala exhibit distinct seasonality, occurring between April and September. This period aligns with the summer monsoons, peak fruiting cycles, and the *Pteropus* bat breeding season

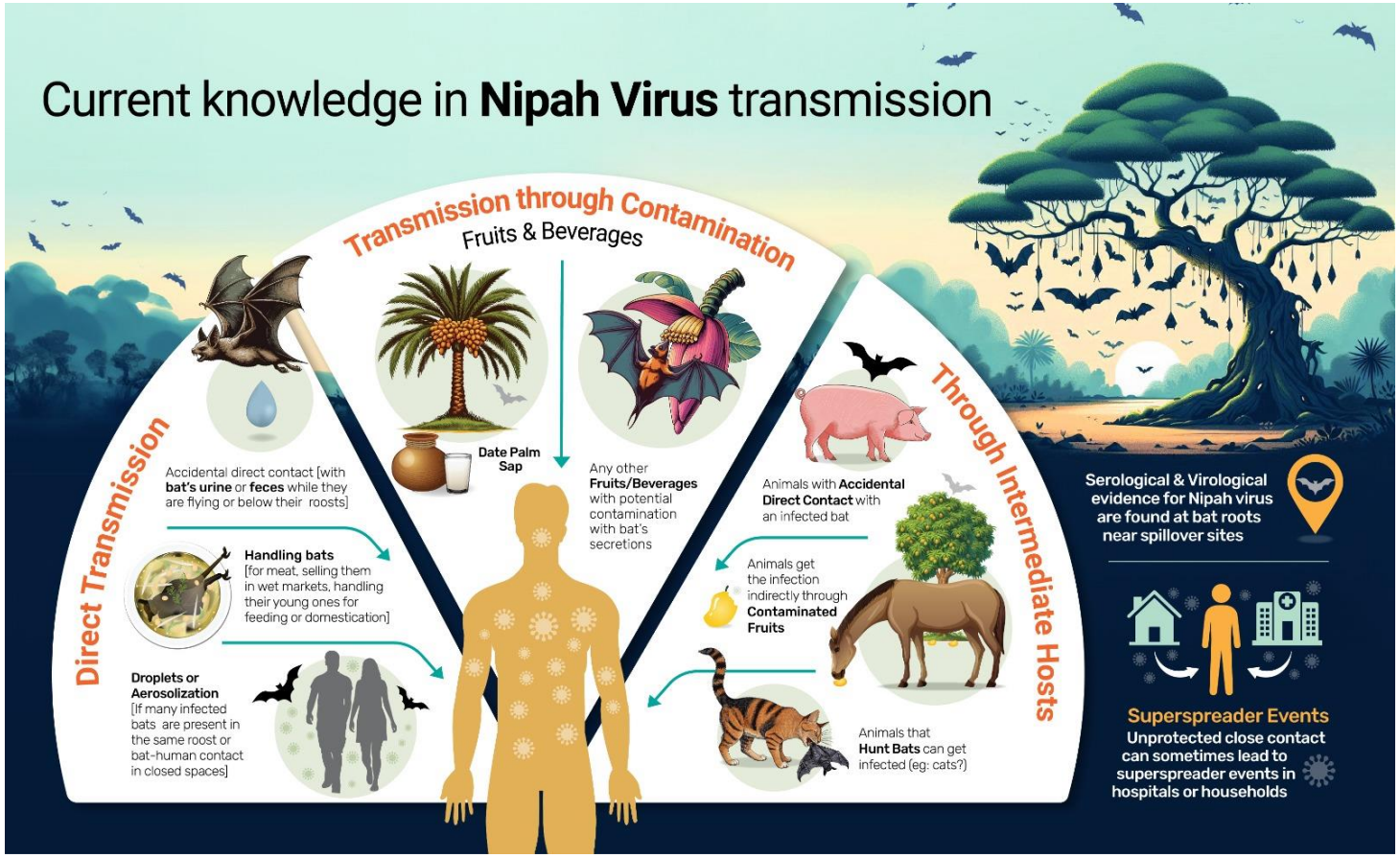


Key learnings

8. Beyond contaminated food, the presence of viral RNA in *P. medius* visceral organs and rectal swabs highlights the risk of infection through contact with bat tissues or excrement. Additionally, domestic predators like cats could bridge the gap between bats and humans, potentially acting as intermediate hosts

Key learnings

9. While bitten fruits tested negative for the virus, NiV was confirmed virologically and serologically in all *Pteropus medius* colonies located near the outbreak clusters



Key learnings

10. Our success is a direct result of our collaborative efforts

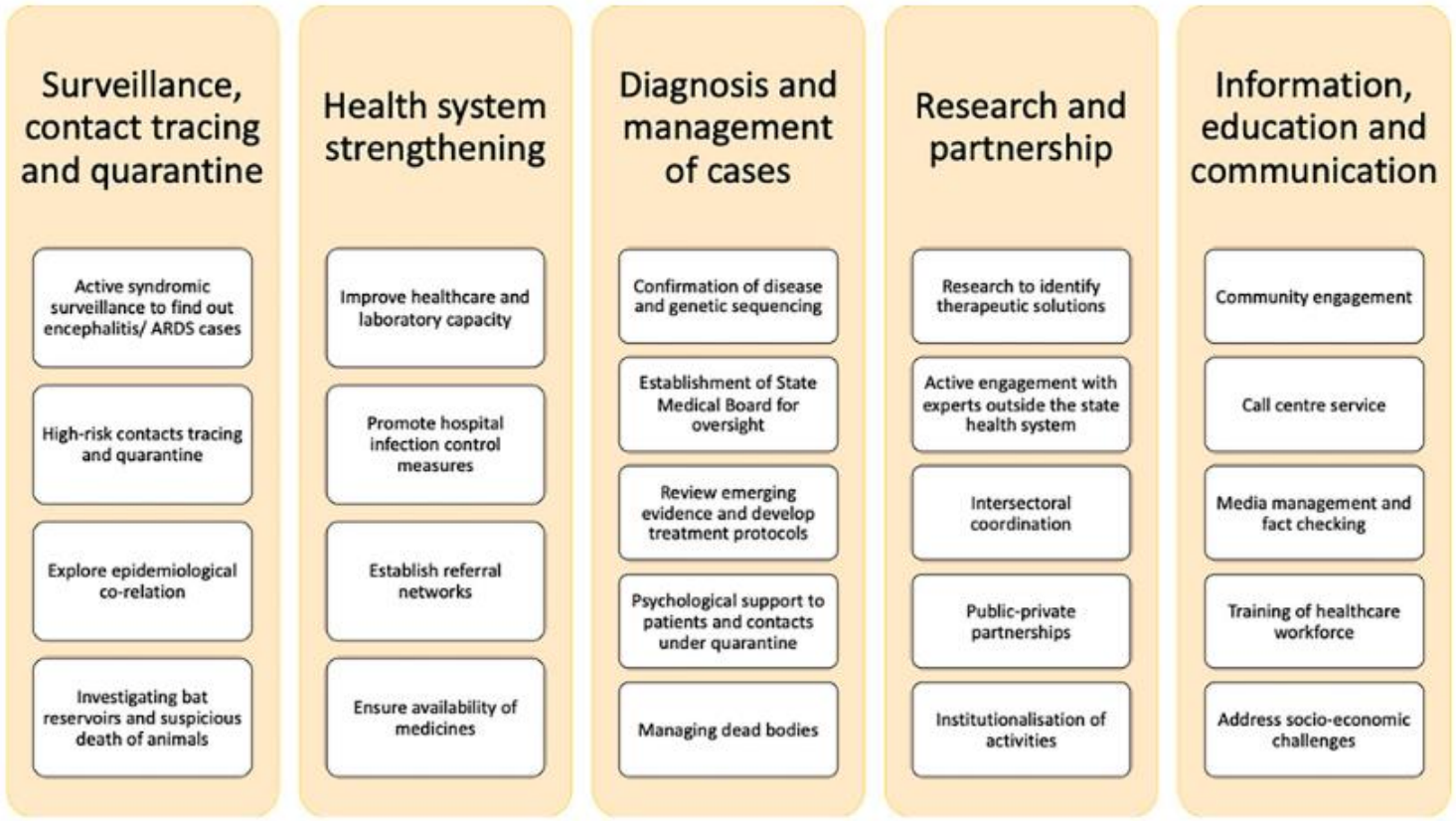


Fig 3. Health system response and activities in Kerala following identification of a NiV spillover.

https://doi.org/10.1371/journal.pgph.0003926.g003

Thank You

Nipah cases 2026 : Barasat
How we manage?

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Associate Professor & HOD

Department of Infectious Diseases

IPGME&R, Kolkata

Cluster of Acute Encephalitis Syndrome

- 2 nurses of Narayana Hospital, Barasat
- Similar presentation
- Cases happened one after another
- The neurologist and the critical care expert discussed it with Dr. Sayantan Banerjee, ID expert & microbiologist from AIIMS, Kalyani
- He personally seen both on 11 th January 2026

Female Nurse

- Fever for 6 days followed by sudden unconsciousness with frequent generalized tonic clonic seizures
- Admitted at Bardwan Medical College intensive care unit through emergency (**4th January 2026**)
- Rapidly deteriorating ARDS needing mechanical ventilaton
- Multiple antiepileptics given to control seizures
- Acute Tropical Fever work up – negative
- Lumber Puncture undertaken immediately

Female Nurse … contd.

- CSF – cells – 80/mm3 (90% Lymphocytes), Protein 101 mg/dl
- CSF – Gram stain, ZN stain, Xpert MTB/ Rif for TB – Negative

- Put on Aciclovir, Ceftriaxone, Vancomycin
- After 2 days shifted to her working Hospital at Barasat (**6th January**)
- No improvement over 6 days (GCS 3/15)
- Went to a village at Indo Bangladesh border to attend a marriage ceremony for 2 days 15 days before onset of symptoms

Male Nurse

- Fever, chills and headache for 9 days
- Admitted at Narayana Superspeciality Hospital **on 4th January 2026**
- Subsequently nausea, vomiting for next 4 days and on 8th January agitation, restlessness and irrelevant talks with sudden desaturation
- Over 2 days multiple GCTS with deep come requiring Intubation with a mechanical ventilation with FiO2 30% (mainly for Airway)
- AFI work up, Flu PCR, CSF multiplex PCR, CBNAAT for TB– negative
- CSF – lymphocytic pleocytosis, elevated protein & preserved glucose

MRI brain

Female Nurse

- Multiple small acute diffusion restricting lesions of bilateral subcortical & deep cerebral white matter, thalamo-capsulo ganglionic area, cerebellum, brain stem. Dirty sulci, multiple infracts, numerous punctate haemorrhages, diffuse leptomeningeal enhancement.

Male Nurse

- Multiple small acute diffusion restricted lesions of bilateral cerebral white matter, deep grey nuclei, brainstem, cerebellar hemispheres. Multiple acute infracts and diffuse leptomeningeal enhancement
- CT Chest – B/L GGOs, B/L moderate Pleural effusion

Thought process on Sunday 11th January

- ID expert roped in from AIIMS, Kalyani
- Got History of Female Nurse of going to village at Indo Bangladesh Border 15 days before onset of illness
- Both nurses given common duty – 20 & 21st Dec 2025 – Given CPR to a dying ARDS patient (very short course of illness)
- No H/O raw date palm sap consumption – Both CGS -3
- Nipah was a differential and RT PCR for Nipah undertaken By Dr Sayantan at after noon at AIIMS, Kalyani.
- All 6 samples (urine, blood, NP/ OP swab) - positive

Sunday Night (11th Jan) – worked done

- Myself got a call from health department and Dr Sayantan
- Both patients were already in isolation in ICU
- Oral Ribavirin 2 gm through Ryles Tube at 10 am (Courtesy Mr Somnath Mukherjee, rided bike on chilling cold to supply it)
- Process to procure IV Remdesivir – requested health department
- The team of Neurologist (Dr Ananya Das), Critical Care Expert (Dr Swarup Pal) and pulmonologist – joined hand and working till today
- Adequate infection control measures – PPE, Donning, Doffing, Fomite measures

ID experts consensus

- Ribavirin 2gm loading followed by 1.2 gm BD x 9 days
- Remdesivir 200 mg iv loading followed by 100 mg iv OD x 9 days
- Fabipiravir 1600 mg orally BD then 800 mg BD x 9 days

- Decided that we shall follow up regularly till ID issues are over

Course of illness

- Got Remdesivir after 3 days
- When remdesivir initiated at that time the male patients started moving limbs spontaneously
- After 3 days of Remdesivir the male patient was responding to commands
- But both required multiple antibiotics for ventilator associated pneumonia with the lady needing ionotropes
- Subsequently VAP – cured, off ionotropes , off ventilator
- Both RTPCR negative after 10 to 15 days of diagnosis

Current status

- Male nurse – discharged home with normal physical function and few incoherent talks and will be on neurological follow up
- Female nurse – Tracheostomised, general supportive care, on room air, GCS – 5/15, still at hospital with her colleagues.
- No health care worker or contact tested positive or symptomatic.

Lessons learnt

- Early diagnosis and best supportive care
- Early initiation of available antiviral
- Adequate management of secondary infection and seizures
- Starting Remdesivir early
- Do not discard good old & cheap – Ribavirin
- HIC measures - still covid experience helps.
- Bring your best intensivist in the team (Dr Swaruup Pal & Prof Sugata Dasgupta)

Thank you

My special acknowledgement : Nursing team of Narayana Superspceciality Hospital, NCDC, AIIH&PH, NIV & NIRBI and Health Department (Govt of WB, India)

NIPAH VIRAL DISEASE INCIDENT IN WEST BENGAL, INDIA,2026

How it has been controlled

Dr. Dipankar Maji, State surveillance Officer,

Integrated Disease Surveillance Programme, West Bengal

4th February 2026

CURTAIN RAISER

- A private hospital in a district town about 25 kms away from the City of Kolkata.
- A female nurse of the hospital, aged about __ years transferred in to her own institution on 04 January, '26 from another hospital about 100 kms away near her home town in unconscious state.
- She had respiratory insufficiency and was already put on ventilator.
- She had prodromal symptoms of fever & cough since 31 December, saw a local doctor and became unconscious in the early morning of 04 Jan.

CURTAIN RAISER…..*CONTD.*

- A male nurse of the same private hospital, aged 25 years, was admitted to that hospital on 04 January, ’26 for work-up of persistent fever with headache & cough.
- His symptoms had started from 27 December.
- On 06 Jan, started vomiting and on 08 Jan developed shortness of breath with restlessness.
- By 09 Jan, he had clear features of acute encephalitis.
- On 11 Jan he had to be put on mechanical ventilation.

CURTAIN RAISER…..*CONTD.*

- Diagnostic work-up was done for acute encephalitis in both these cases. No organism could be detected.
- CSF study showed features of viral encephalitis.
- On MRI of brain both of them showed bilateral multiple small acute diffusion restricting lesions, consistent with acute infarcts.
- The female nurse had a history of visit to a village in Nadia District close to the border with Bangladesh.
- The neurologist of the private hospital sensed something and called an infectious diseases special specialist of All India Institute of Medical Sciences, Kalyani for a consultation.

THE ALARM WAS PRESSED!

- The doctor from AIIMS took samples from both the cases on 11 Jan, tested them in his lab and found both to be positive for Nipah on RT-PCR.
- He notified this to the Central Govt. level in the late evening of 11 Jan.
- From there, information came to the Principal Secretary of State Health Department.
- The alarm was pressed !

ACTION STARTED

- An online meeting held at the night of 11 Jan itself – involving Experts, Health Administrators, WHO (NTD) and the private hospital.
- The two patients were immediately isolated within their hospital.
- The village in Nadia visited by the female nurse suspected as the source place of infection.
- The two nurses had overlap of duty hours on 19-21 Dec. So, the female nurse considered as the primary case and her male colleague as a secondary case.
- However, there were doubts about it. (We'll come again to it later).

CONTACT TRACING STARTED

- On 12 Jan morning Rapid Response Teams from state & district levels arrived at the hospital.
- Collected detailed history of movement and possible exposure of the two cases from their relatives and roommates.
- Contact tracing exercise started within and outside the hospital.
- The young lady had history of movement, after initiation of symptoms, to a professional examination centre, to her home town and visits at one local doctor and two hospitals at/near the home town.
- The male patient had only local movements, not beyond.

MAPPING OF MOVEMENT

- A National Joint Outbreak Response Team (NJORT) formed by the Central Government.
- Members of NJORT reached Kolkata by morning of 13 Jan.
- National Institute of Virology, Pune also pressed into action. Confirmation of lab diagnosis came from there.
- NJORT and Rapid Response Teams of North 24-Parganas (focus district) & Purba Bardhaman (home district of the lady) worked in convergence.
- Detailed route map of movement of the cases was chalked out.

SUMMARY OF CONTACT TRACING

- Contact tracing exercise yielded 71 and 82 contacts in North 24-Parganas (focus district) and Purba Bardhaman (home district of the female case) respectively.
- A fresh guideline was issued by State Health Department – on definition of high & low risk contacts and their follow-up actions.
- By 15 Jan contact listing was complete. A total of 174 contacts – 48 of them high risk contacts and rest 126 low risk, were listed.
- 26 of them were very close contacts and some of them had mild symptoms like fever, cough & cold. They were put in institutional quarantine.
- Rest were sent to home quarantine and were followed up telephonically twice a day.

RESULTS OF CONTACT TRACING

- Samples were collected from all the contacts.
- From 12th to 14th Jan tests were done in AIIMS, Kalyani.
- From 15th Jan the Mobile BSL-3 Lab of NIV that was rushed to Kolkata, performed the tests.
- Ribavirin was given to the high risk contacts.
- RT-PCR results of all the contacts came negative.
- Contacts were tracked till 21 days from last possible exposure.
- Those who had mild symptoms, soon were symptomless.

ACTUAL PRIMARY CASE?

- The male nurse could have contact with the female nurse during 19-21 Jan till when the latter didn't develop any symptom.
- Then was she really the primary case? Could it be so that both of them were secondary to an unknown primary?
- Thorough search of the records of the private hospital revealed one case from a suburban are (not very far):
  A lady of 55 years who had fever, diarrhoea, dizziness; developed pneumonia & ARDS with AES; died in the same hospital on 22 Dec.
- She had history of consumption of raw date palm sap 16-17 days back and also history of handling fruits in her household fruit garden.
- Both the nipah positive cases attended to her very closely during 21-22 Dec

COURSE OF THE CONFIRMED CASES

- Infectious disease specialists, through consensus, brought out a treatment guideline.
- Both the cases were accordingly administered a course of remdesivir and ribavirin.
- The male nurse recovered. 2 sets of samples tested negative on RT-PCR at an interval of 5 days. He was sent home on 30 Jan.
- The female nurse have come out of ventilator. But she is still unconscious (GCS score has improved only a little). Still positive on RT-PCR.
- So, altogether only 2 cases of Nipah in this incident in West Bengal.
- Other loosely suspected cases reported from different hospitals all proved to be negative on lab test by NIV Team.

POSITIVE ASPECTS OF THE EXERCISE

- NJORT, NIV, AIIMS-Kalyani, WHO (NTD), State and District Health Teams and the concerned Hospitals – all worked in close coordination.
- Synchronization among the concerned branches of the State Health Department.
- State Drug Store procured the anti-virals in war footing.
- Specific guidelines helped the personnel down the line.
- Control Room opened at the state headquarter to address concerns.

CHALLENGES

- Out of concern, many people unnecessarily request for test.
- A big lot of health care providers, if put into quarantine, could put the hospitals in trouble.
  We allowed low risk contacts to continue to work with barriers on.
- The message “Do not take raw date palm sap” could harm the molasses industry.

THE END SLIDE

- 2007 incident in Nadia District of West Bengal: 5 cases – 5 deaths.
- This time – only 2 cases. The transmission could be fortunately halted at the very focal point.
- State Health Department is now in the process of developing a further action plan for systematic surveillance and any further emergent situation.