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## NIPAH DISEASE IN MALAYSIA

### EMERGENCY REPORT

*Text of a report received on 17 May 1999 from Dr Mohd Nordin Mohd Nor, Director General of Veterinary Services, Ministry of Agriculture, Kuala Lumpur:*

**Report date:** 15 May 1999.

### 1. History of human cases

The outbreak of Nipah disease in Malaysia, which has caused human fatalities, has been attributed to a viral infection in pigs. The outbreak in 1998/99 has been investigated and traced back to earlier incidences which were provisionally diagnosed as Japanese encephalitis (JE).

In 1997, the illness was reported in a number of pig-farm workers, one of whom died. Most of them received treatment at private hospitals.

In 1998, more cases of viral encephalitis were reported and two more villages were affected. A special Task Force comprising officers from the medical and veterinary departments was formed. By the end of 1998, ten workers from Tambun, Ulu Piah and Ampang had died from the disease after being in a coma for periods ranging from four days to a few weeks. Among the viral encephalitis cases, only about 15% were confirmed as JE, leaving the remaining 85% undetermined.

By mid-December 1998, the disease had spread to Sikamat, about 60 km south of Kuala Lumpur, through movement of infected pigs. Seven of the 20 workers developed the disease and five died in January 1999.

By March 1999 the disease had spread to the major pig producing area of Bukit Pelandok in the State of Negeri Sembilan.

The Department of Medical Microbiology, University of Malaya, successfully isolated an unknown virus. The virus was sent to the Arbovirus Research Center, Center for Disease Control (CDC) in Fort Collins, Colorado, United States of America. There, the Malaysian and United States scientists worked together to study the characteristics of the virus. On 18 March 1999, the CDC announced that the isolate was of a genus closely related to the Hendra virus, a paramyxovirus first isolated in Brisbane, Australia, in 1994. On 10 April 1999, the isolate was officially called the Nipah virus, named after the village Sungai Nipah in Negeri Sembilan, where the worker from whom the virus was isolated had died.

The disease spread to more farms and, from 1 March to 10 May 1999, a total of 224 suspected cases of viral encephalitis occurred in Negeri Sembilan with 80 fatalities.

Out of a total of 258 persons suspected of being infected with the Nipah virus, 100 have died.

As a measure to control the spread of the new virus, farmers and their families have been instructed to leave their villages and settle temporarily in schools and community halls outside the affected district. Assistance has been sought from experts in the CDC and Australia to help with the diagnosis and control of Nipah disease.

## 2. Clinical picture in humans

- Mild to severe clinical signs.
- Fever and headaches of varying severity.
- A few patients present drowsiness and disorientation, later falling into a coma and requiring artificial respiration.
- A majority of the patients in a coma subsequently die
- The full course of the disease is still unknown.
- The incubation period is postulated to be from one to three weeks.

Some patients have shown serological reactivity without clinical signs.

## 3. Disease in pigs

- Generally, mortality is low but morbidity is high.
- Spread of the disease between and within pig farms has not been established.

### 3.1 Clinical signs

#### a) Weaners and porkers

- Mild to severe coughing, with varying reports of mortality and morbidity.

#### b) Sows and boars

- Disease more pronounced, including moderate to severe respiratory disorder characterised by dyspnoea, convulsions and death.
- In boars, disease may be acute, death occurring within several hours. Thick mucopurulent discharge and pneumonia in less severe forms.

#### c) Piglets, gilts and sows

- Convulsions and other neurological signs.

### 3.2 Necropsy

- Varying degrees of consolidation of the lungs, primarily the diaphragmatic lobes (prominently thickened interlobular septa).
- Cut surface showed exudate of varying consistency in the bronchi.
- Kidneys showed congestion both on the surface and in the cortex.
- Brain appeared normal except in a case with petechial haemorrhage.
- Other visceral organs appeared normal.

## 4. Disease in other animals

Serologically positive dogs, cats, horses and goats were found in the infected areas.

Dogs: lesions observed at necropsy of dogs presenting clinical signs were similar to those of affected pigs. Kidneys showed severe haemorrhage and congestion. Exudates were present in the trachea and bronchi.

## 5. Mode of transmission

Transmission studies in animals are being carried out at the Australian Animal Health Laboratory (AAHL), CSIRO<sup>(1)</sup>, Australia.

### 5.1 Oral inoculation

- Incubation period for clinical signs was 14 to 16 days.
- Clinical signs and gross pathology were mild.
- Virus isolation work is in progress.

## 5.2 Parenteral inoculation

- Two inoculated pigs developed a more severe disease, one showing a central nervous system syndrome and the other a respiratory tract syndrome. Signs developed within 7 to 10 days of challenge.

## 5.3 In-contact pigs

- Infection occurred quickly, possibly at first contact. Neutralising antibodies were detected at day 14.
- Virus multiplication in the tonsils and respiratory epithelium, together with contaminated cellular debris in the lumen of air passages in the lung, suggests that the virus may at least be transmitted by pharyngeal and bronchial secretions.

Other results are pending.

## 6. Diagnosis

### 6.1 Virus isolation

Tissue samples of lung, liver, kidney, spleen, heart and brain were collected from necropsied animals for virological examination. Samples were sent to the CDC in Atlanta, Georgia, United States of America.

Molecular studies done on the virus isolate showed a 21% difference in the nucleotide sequence and an 11% difference in the amino acid sequence compared to the Hendra virus.

### 6.2 Serological tests

Two laboratories, namely the Veterinary Research Institute (VRI), Ipoh, and the Task Force Laboratory at the Department of Medical Microbiology, University of Malaya, were selected to carry out serological tests on the veterinary and human sera respectively. Samples were tested using the IgG and IgM capture ELISA at the above laboratories and virus neutralisation tests at AAHL, Geelong (Australia).

## 7. Results of serological surveillance in animals during the outbreak period

### 7.1 Pigs

In a previously infected farm, more than 95% of sows had Nipah virus antibodies. More than 90% of the piglets had antibodies assumed to be maternal antibodies. Antibody prevalence across all ages is currently being studied in an infected farm.

### 7.2 Horses

At a farm in an infected area, 2 of the 47 polo horses were found to have Nipah virus antibodies and were euthanised. All racehorses in the country have tested negative.

### 7.3 Dogs

More than 50% of dogs captured in one of the infected areas were positive to Nipah virus by IgG capture ELISA using Hendra antigen.

Antibodies in dogs in other infected areas are also being studied.

### 7.4 Cats

Out of 23 cats tested in the affected area, one was seropositive.

### 7.5 Bats

Out of 99 flying foxes tested, 15 were found to be positive to the virus neutralisation test for the Nipah virus.

### 7.6 Rodents

To date, serum samples from rats trapped in infected areas have all been negative. Further tests are in progress.

### 7.7 Other animals

Sera have also been collected from cattle, goats, sheep, squirrels, wild boar, wild birds, poultry and ostriches for later testing.

## 8. Control and eradication programme

### 8.1 Control Programme for Nipah Disease Phase I

With the discovery of the aetiology of the disease, a programme was developed for immediate eradication of the disease by mass culling of pigs. From 28 February to 26 April 1999, a total of 901,918 pigs were culled in four infected areas (one in the State of Perak, one in Selangor and two in Negeri Sembilan).

### 8.2 Control Programme for Nipah Disease Phase II

A surveillance programme was developed to detect previously infected farms by testing for the presence of pigs with antibodies to the Nipah virus.

All farms outside the previously designated high risk areas will be screened by taking a statistically valid random sample of sows for detection of Nipah virus antibodies. Farms with two consecutive negative tests performed within an interval of three weeks will be accorded "provisionally free" status. However, farms found to be positive during the first or second tests will be depopulated.

To date, 235 farms have been tested, of which 9 were found to be positive. A total of 23,736 animals and 11,458 pigs in 4 of the positive farms have been culled. In this programme a total of 824 farms with a 1.6 million SPP (standing pig population) will be tested.

## 9. Actions for the future

Investigations will continue in order to ascertain the natural hosts of the Nipah virus and the modes of transmission to domestic animals and humans.

The outbreak has given the Government of Malaysia an opportunity to review the status of the pig industry and the direction for revival of the industry.

(1) CSIRO: Commonwealth Scientific and Industrial Research Organisation.

**AFRICAN HORSE SICKNESS IN SOUTH AFRICA**  
**Follow-up report**

FOLLOW-UP REPORT No. 2

*Text of a fax received on 20 May 1999 from Dr Emily Mogajane, Director, Animal Production and Health, Pretoria:*

**End of previous report period:** 30 April 1999 (see *Disease Information*, 12 [16], 56, dated 30 April 1999).

**End of this report period:** 20 May 1999.

Three more deaths and one additional infected property have been registered in the Stellenbosch district, in the African horse sickness (AHS) surveillance zone of the Western Cape province, about 35 km from the free zone. All 18 infected properties are located within a radius of about 15 km, between 33° 50' and 34° 1' S and between 18° 47' and 18° 55' E.

**Total number of animals in the outbreak:**

<i>susceptible</i>	<i>cases</i>	<i>deaths</i>	<i>destroyed</i>	<i>slaughtered</i>
485	32	27	4	0

**Diagnosis:** seven cases have not yet had a confirmed virus isolation or antigen capture ELISA test.

**Control measures:**

- Horse owners outside the quarantine areas in the AHS surveillance zone may vaccinate horses with the State Veterinarian's permission. Vaccination may only be performed by a registered veterinarian.
- All exports of horses from the AHS free zone of South Africa have been suspended. Exports of horses from the rest of South Africa are not affected.

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**SHEEP POX IN SAUDI ARABIA**

**(Date of last previously reported outbreak:** August 1996).

*Extract from the report of Saudi Arabia for March 1999, received on 25 May 1999 from Dr Omar A. Hashem, Director of Animal Quarantine, Ministry of Agriculture and Water, Riyadh:*

**No. of new outbreaks of sheep pox in March 1999:** two (2).

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## CLASSICAL SWINE FEVER IN GERMANY

(*Date of last previously reported outbreak*: November 1998).

### EMERGENCY REPORT

*Text of a fax received on 25 May 1999 from Dr Werner Zwingmann, Chief Veterinary Officer, Ministry of Food, Agriculture and Forestry, Bonn:*

*Report date*: 25 May 1999.

*Nature of diagnosis*: laboratory.

*Date of initial detection of animal health incident*: 21 May 1999.

### Outbreaks:

Location	No. of outbreaks
Köln (Cologne) district, Nordrhein-Westfalen	1

*Description of affected population*: breeding pigs.

### Total number of animals in the outbreak:

<i>susceptible</i>	<i>cases</i>	<i>deaths</i>	<i>destroyed</i>	<i>slaughtered</i>
47	1	0	47	0

### Diagnosis:

*A. Laboratory where diagnosis was made*: Staatliches Veterinäruntersuchungsamt, Krefeld.

*B. Diagnostic tests used*: virus isolation.

*Source of agent / origin of infection*: unknown.

### Control measures during reporting period:

- the animals have been slaughtered and will be destroyed in rendering plants;
- ban on the movements of animals of susceptible species in an area around the infected holding;
- tracing of animal movements into and out of the infected holding.

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## INFECTIOUS HAEMATOPOIETIC NECROSIS IN FRANCE

(*Date of last previously reported outbreak*: December 1998).

### EMERGENCY REPORT

Summary of the translation of four reports received by fax on 26 May 1999 from Dr Jean-Pierre Bournigal, Head, International Health Coordinating Mission, Ministry of Agriculture and Fisheries, Paris:

*Date of reports*: 19 May 1999.

*Nature of diagnosis*: laboratory.

*Date of initial detection of animal health incident*: 26 February 1999.

*Estimated date of first infection*: 1 September 1998.

### Outbreaks:

Location	No. of outbreaks
Nièvre department, Burgundy region	1
Manche department, Normandy region	3

### Description of affected population:

- Nièvre outbreak: rainbow trout (*Salmo gairdneri*).
- Manche outbreaks: brown trout (*Salmo trutta fario*) in one of the farms.

### Total number of animals in the outbreaks:

<i>susceptible</i>	<i>cases</i>	<i>deaths</i>	<i>destroyed</i>	<i>slaughtered</i>
769,550	30,120*	4,100	72,000	...

\* no clinical cases have been registered in two of the farms in the Manche department.

### Diagnosis:

#### A. Laboratories where diagnosis was made:

- Nièvre outbreak: French Agency for Food Safety (AFSSA, former CNEVA), Maisons-Alfort.
- Manche outbreaks: Orne Departmental Laboratory, Alençon.

#### B. Diagnostic tests used: isolation on cell culture and identification by virus neutralisation and immunofluorescence.

### Epidemiology:

- Nièvre outbreak: origin unknown.
- Manche outbreaks: one outbreak was due to the introduction of fish from an infected fish farm; the origin of the second outbreak, which was detected during systematic screening carried out within the framework of the fish farm certification procedure, is not yet known; the third outbreak was due to contamination by a neighbouring farm.

### Control measures during reporting period:

- Quarantine of the affected premises.
- Tracing on and tracing back.
- Ban on the movements of fish within an area around the outbreaks.
- Nièvre outbreak: destruction of all fish present in the farm.

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