馬匹乙類傳染病

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內容大綱

Part 1

- 非洲馬疫
- 泰國經驗分享 - 向泰國獸醫取經
- 台灣現況與風險分析

Part2

- 馬匹乙類傳染病

2

乙類傳染病

- 乙類疾病主要為世界動物衛生組織規定應通報動物傳染病

- 移除
  - 馬痘
  - 馬疥癬
  - 馬接觸傳染性子宮炎
  - 馬媾疫
  - 馬傳染性貧血症
  - 馬A型流行性感冒
  - 馬焦蟲病
  - 馬鼻肺炎
  - 馬病毒性動脈炎
  - 蘇拉病

- 新增
  - 馬腦脊髓炎加註 Eastern, Western及Venezuelan

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炭疽

- Anthrax
- Zoonosis, OIE listed
- 細菌病原：*Bacillus anthracis* 炭疽桿菌
  - G(+)、有夾膜、無運動性
  - 暴露於空氣中則形成芽孢形態發育，一旦形成芽孢後，在土壤及動物皮毛中可存活數十年之久
  - 所有溫體動物 (尤其草食獸) 皆有可能感染，特徵是引發敗血症後迅速死亡
- 1999 於台北近郊馬長曾發生一匹馬受感染暴斃的病例

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台灣獸醫誌 Taiwan Vet J 35 (4): 241-247, 2009

Case Report: The First Case of Anthrax in a Horse in Taiwan

[1,2] Shu-Hwae LEE, [3] Hung-Chi LIN, [3] Hsien-Yuan CHIANG, [2] Kuo-Hui CHANG, [2] Ming-Chu CHENG, [4] Chwan-Heng WANG, [*1] Tien-Jye CHANG

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(Received: April 6, 2009. Accepted: May 19, 2009)

病例報告：馬感染炭疽在臺灣之首次病例報告

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[3] 國防醫學院　台北市
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（收稿日期：98 年 4 月 6 日。接受日期：98 年 5 月 19 日）

摘要　本病例報告為台灣動物感染炭疽之首例，1999 年 11 月間，北部地區某騎馬俱樂部一匹純種熱血馬在未見任何臨床症狀的情況下突然死亡，病變包括鼻腔有黑褐色分泌物及全身瀰漫性水腫，其剖檢病變包括：心、肝及脾臟表面有出血斑，內含大量未凝固血液。胸腔及腹腔內有血色漿液纖維素性滲出液，肋膜面有白色纖維素物附著。所有臟器的塗抹片皆可見格蘭氏陽性桿菌。組織檢體進行細菌培養及其他實驗室檢查，包括 FA 染色 (fluorescence-labeled antibody staining)、毒力因子基因 PCR 及 Ascoli precipitin test，證實病原為炭疽桿菌。[李淑慧、林宏基、蔣光元、張國慧、鄭明珠、王傳亨、*張天傑。病例報告：馬感染炭疽在臺灣之首次病例報告。台灣獸醫誌 35 (4): 241-247，2009。*聯絡人 TEL: 886-4-2286-2457，FAX: 886-4-2285-9222，E-mail: tjchang@dragon.nchu.edu.tw，E-mail: shlee@mail.nvri.gov.tw]

關鍵詞：炭疽，馬，臺灣，病理學

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馬炭疽

VRI 獸醫科技資訊網

建立日期 96年01月18日
更新日期 96年01月18日

https://vettech.nvri.gov.tw/view.php?theme=web_structure&subtheme=&id=1501&print=Y

內容

一、病歷：

台北市某騎馬俱樂部，一匹十歲競速用熱帶純種馬(Thoroughbred)，俗名為黑玫瑰，88.11.23凌晨5點多，突然死亡，畜主以為是毒蛇咬傷致死，於當日中午1:00送至本所剖檢。

二、肉眼病變：

1.	外觀：四肢、頭部、體軀及肛門、腹部等皮膚皆無任何外傷。
2.	鼻部：浮腫、左側眼瞼腫脹、鼻腔潮紅，流出暗褐色血水(圖1)。
3.	血液：不凝固，呈暗黑色(圖2)。
4.	鼻粘膜：潮紅、出血、壞死。
5.	頭部鼻骨處：皮下組織嚴重出血、水腫，可見黃褐色漿液性滲出液蓄積(圖3)。
6	脾臟：腫大，內含大量未凝固血液，切面似草莓果醬狀。脾小結突起明顯。
7.	氣管：粘膜潮紅、漿膜面水腫、氣管腔內佈滿帶血泡沫狀液體(圖4)。
8.	肺：兩側肺葉濕重潮紅，切面含大量未凝固血液呈暗黑色，膈葉肋膜面有白色纖維素物附著(圖5)。
9.	肝：鬆軟呈巧克力色。
10.	胰臟：嚴重出血、壞死，大量黃褐色膠狀物蓄積。
11.	心臟：右心擴張、心冠狀溝脂肪點狀出血，脂肪呈漿液性萎縮，心內膜出血，心肌呈褐色。
12.	左側肩胛肌肉：嚴重出血，有黃褐色膠樣物蓄積。
13.	輕度黃疸。
14.	腸繫膜：水腫，脂肪呈輕度漿液性萎縮。
15.	腸間淋巴：水腫，可見黃色纖維素性膠樣物蓄積。
16.	膀胱：粘膜潮紅。

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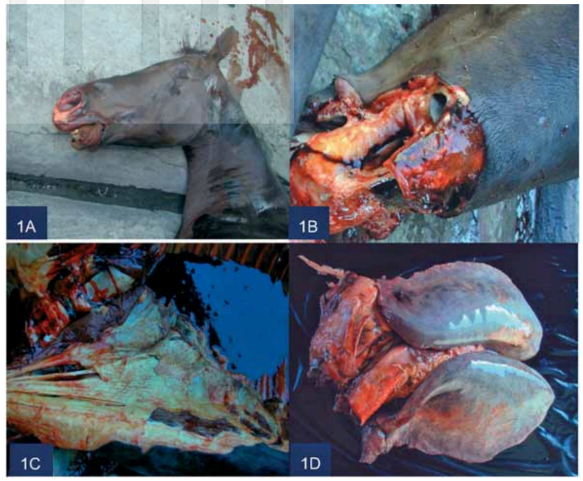


Fig. 1　The gross findings of the case. (A) Extensive swellings of face and dark-brown nasal discharge are noticed; (B) Extensive reddish and edematous swellings on the subcutaneous area around front part of nasal cavity; (C) Dark-red unclotted blood appeared within the thoracic cavity; (D) The entire lung is swollen, heavy with rib imprints..

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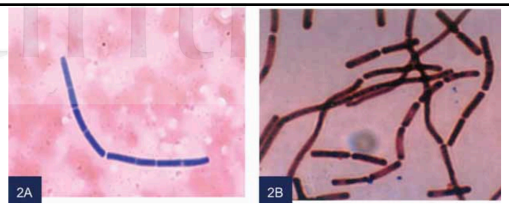


Fig. 2　(A) The blood smears reveals clusters of dark blue diplobacilli with square ends. (Wright's stain); (B) Chains of lar-

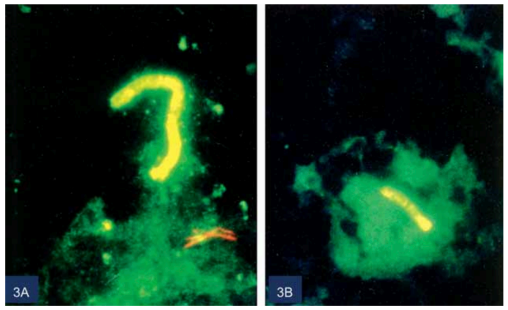


Fig. 3　The *B. anthracis* capsule is detected by FA staining of blood smear (A) and kidney impression smear(B).

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四、實驗室檢驗：

1. 血液抹片經Wright's stain 可見大量齊頭短桿菌呈串狀或兩兩成對狀排列（圖8）。
2. 胰組織按奈抹片，經Wright's stain可見齊頭短桿菌呈串狀排列。
3. 血液抹片經Gram's stain 短桿菌呈陽性反應。
4. 血液及肝、心、脾、肺的菌培養於血液培養基，置於二氧化碳培養箱中，36小時後，
   有少數不溶血、邊緣不整、表面粗糙之菌落形成。
5. 與國防醫學院第二組合作，進行病原菌之鑑定。其鑑定結果如下：
   (1) 單離的菌株具有capsule，FA診斷陽性。Gram (+)桿菌。
   (2) 肝、肺、腎、胰等檢體的Ascoli precipitin test均為 (+)。
   (3) 動物接種測試：以1 ml血液檢體(時間考量) IP注射 2隻BALB/ c Mice (25 g)，經約24小時後，兩隻mice均死亡，解剖發現，胸、腹腔大量出血、水腫，所有organs均有崩潰(collapse)及紫點性出血
   (Petechial hemorrhages)，血液無法凝集，和死亡馬的病理解剖結果很相像。
   (4) PCR結果顯示Cap (capsule)，PA (Protective Antigen)及EF (Edema factor)的Primer皆為
   (+)。

五、診斷：

馬炭疽 (Anthrax in a Horse)

六、討論：

本症屬人畜共同傳染病，在人類之法定傳染病中被列為第二類甲種傳染病，在動物法定傳染病中被列為乙類疾病。草食獸感受性較高，羊、牛、馬、豬最常被感染，豬較有抵抗力，易成為其他動物的疾病保菌者，台灣於1900－1952有少數炭疽病例，史實記錄病牛及病羊共計 667 頭，1952 年最後一個牛隻病例於桃園發生，直到 1999 年 11 月底於台北北投馬場發現一例馬匹病例，人之病例於1929年撲殺炭疽病牛之工作人員，經皮膚感染而發病，最後一例人的病例係1972年於馬祖經吸入途徑而感染本症。

炭疽之病原為 *Bacillus anthracis*，為Gram's陽性桿菌，有莢膜，在不適該細菌生長之環境下很容易呈芽孢形態發育，一旦形成芽孢後，在土壤及動物皮毛中可存活數十年之久，所有溫體動物皆有可能感染本菌，特徵是引發敗血症後迅速死亡，以草食獸感受性較高，羊、牛、馬、豬最常被感染，其他動物則較少見。

*Bacillus anthracis*在活體組織中為增殖型不會有芽孢形成，形態呈長方形，其有厚且明顯之莢膜但無鞭毛，在血液及實質臟器中，常兩兩排列呈鏈狀有如竹節。在有氧或高溫環境中（21°C）菌體中心即形成球狀芽孢，此芽孢對冷、熱、乾燥、化學藥品及酸有極 強之抵抗性，本菌一旦離開活體（感染動物排泄分泌物或解剖打開體腔），曝露在有氧的環境中，會形成芽孢，此期稱為芽孢期，若本菌存於高溫，多濕鹼鬆之土壤環境中，在十幾小時內會大量分裂增殖形成可怕之感染原。故死於本症之動物不應剖解，以優速焚燬為原則。

後續處理及追蹤：該場之環境經徹底消毒，後續追蹤檢測炭疽菌均為陰性，馬匹及
工作人員亦經緊急策略性投藥處理，相關工作人員之血清檢測炭疽皆為陰性。

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10th IEIDC Abstracts / Journal of Equine Veterinary Science 39 (2016) S33–S44

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Anthrax in a horse and post-exposure interventions

G. Gajardo [1], B. Uberti [1], E. Paredes [2]
[1] *Institute of Clinical Veterinary Sciences;* [2] *Institute of Animal Pathology, Faculty of Veterinary Science, Universidad Austral de Chile, Chile*

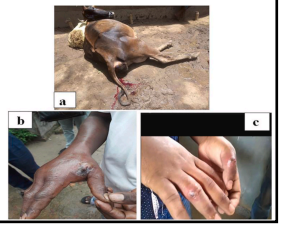
Anthrax is a highly pathogenic zoonotic disease caused by *Bacillus anthracis*, a Gram positive spore-forming bacillus. Although it primarily affects herbivores, other mammals, including humans, can be affected. Animals may have at least three clinical presentations, hyperacute, acute, and subacute or chronic; horses almost always develop the acute form, generally manifesting throatlatch swelling, fever, dispnoea, rapid onset of septicemia, disseminated intravascular coagulation and shock. Bleeding from natural orifices is common in most species. The importance in public health lies in its zoonotic potential. Three forms of presentation have been described in humans: cutaneous, respiratory and digestive, depending on the route of exposure. Lethality in humans is extremely high without rapid detection and treatment. In December 2013, an adult crossbred work horse, belonging to persons of extremely limited resources, presented at the Universidad Austral de Chile's Veterinary Hospital due to sudden decay. No other sick horses were reported at the farm of origin; there was no vaccination history. Clinical examination revealed severe depression, generalized muscle twitching, severe tachycardia and tachypnea, hypothermia, hypovolemia, severe edema of the glottis, and hypotonia of the anal sphincter. During the initial assessment, the patient developed bilateral epistaxis. Faced with signs of respiratory obstruction (due to retropharyngeal edema and lymphadenopathy) and severe coagulopathy, the animal was euthanized. Necropsy revealed blood incoagulability, multiple organ congestion and retromandibular edema. Parotid lymph node samples were taken, and anthrax was confirmed by microbiological culture of *Bacillus anthracis* within 72 hours of death. With this diagnosis, the competent national health service was immediately notified for coordination of post-exposure interventions. Four people had been directly exposed to the animal (two owners and four university employees; two veterinarians were exposed to spore inhalation during necropsy), and 7 others were determined to have been on the premises. The health service provided health monitoring guidelines and antibiotic prophylaxis (ciprofloxacin 500 mg twice daily) for a period of 60 days for all exposed owners and personnel. All directly exposed individuals' clothing and residual biological material was incinerated. The equine veterinary hospital was emptied of all animals (none of which were exposed to the patient), and contaminated premises were thrice disinfected with quaternary ammonia and glutaraldehyde. There were no manifestations of disease in the people involved, and no ulterior equine cases. Although anthrax is endemic in Chile, with 37 human cases reported between 2000-2009, animal vaccination is rare and no equine cases have been described since 1990 (Araya et al, 1990). This case is noteworthy on account of the rare occurrence of the disease, and because rapid cooperation of veterinarians and the national health service permitted continued monitoring and prophylactic treatment of the university personnel and of the poorly educated owners of the horse, thereby avoiding human cases. Thus, urgent mandatory reporting of suspected cases should be emphasized.

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炭疽 in humans

3 distinct patterns:

- Cutaneous: the most common
  - People handling infected animals/products
  - Owners, grooms & vets
  - Needs a “lesion” to infect
- Gastrointestinal
- Inhalation



(TS Pan et al., 2025)

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亨德拉病毒

- Hendra viru s (HeV)
- Zoonosis
- 病毒病原：副黏液病毒科
  - *Henipavirus, Paramyxoviridae*
  - Enveloped, negative-sense, single-stranded RNA virus
- 1994 年在澳洲布里斯本，造成13匹馬、及其訓練師之死亡
  - 第一次病毒分離
  - 過去被認為是 Morbilliviruses 麻疹病毒屬, *Paramyxoviridae*

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傳播途徑

Hosts

- Fruit bats (suborder *Megachiroptera*)
  - Flying fox (*Pteropus* spp.): predominant natural host
- Humans, horses, swine, dog (only 1 case confirmed)

Transmission

- Ingested
- Inhalation
- Contact fluids from infected animals, especially urine of infected horses
  - Owners, grooms, vets
- No human-human transmission recorded

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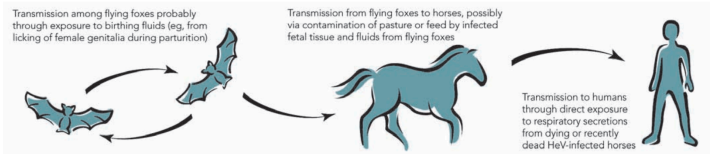
NOTABLE CASES

Hendra virus infection in a veterinarian

Jeffrey N Hanna, William J McBride, Dianne L Brookes, Jack Shield, Carmel T Taylor, Ina L Smith, Scott B Craig and Greg A Smith

A veterinarian became infected with Hendra virus (HeV) after managing a terminally ill horse and performing a limited autopsy with inadequate precautions. Although she was initially only mildly ill, serological tests suggested latent HeV infection. Nevertheless, she remains well 2 years after her initial illness. Recently emerged zoonotic viruses, such as HeV, necessitate appropriate working procedures and personal protective equipment in veterinary practice. **(MJA 2006; 185: 562-564)**

2 Possible mode of transmission of Hendra virus (HeV) infection



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馬匹感染臨床症狀

Non-specific

- 高燒
- 臉部水腫
- 嚴重呼吸困難 → 終末期：大量泡沫樣鼻分泌物冒出

其他：

- 神經症狀：共計失調、痙攣
- 疝痛樣症狀

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馬匹感染肉眼病變

Most common

- Severe pulmonary oedema and congestion
- Dilated pulmonary lymphatic vessels

Others

- Generalised degeneration of small blood vessels in various organs
- Syncytial endothelial cells containing viral antigen

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人感染臨床症狀

呼吸道症狀、腦膜腦炎症狀

潛伏期：4-18天

- 嚴重流感之呼吸道症狀
- 輕微腦膜腦炎（早期）

此新興病毒傳染病屬於P-4等級病原體，部分實驗需 在P-3及P-4實驗室進行，病原之最後確認工作，則 將與美國CDC合作進行

衛生福利部疾病管制署 Taiwan Centers for Disease Control

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ORIGINAL RESEARCH article

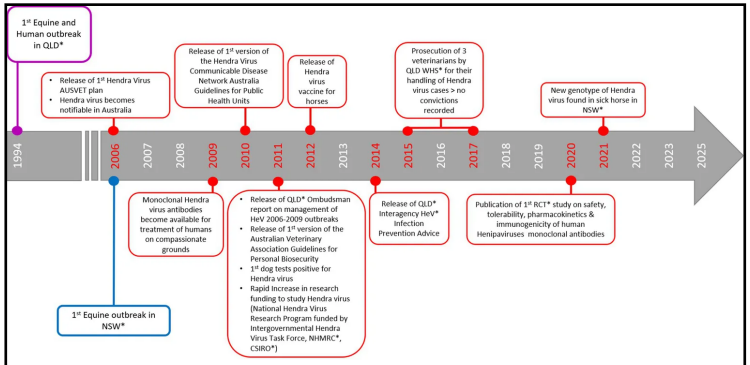
Front. Vet. Sci., 21 November 2025

Sec. One Health

Volume 12 - 2025 | https://doi.org/10.3389/fvets.2025.1661615

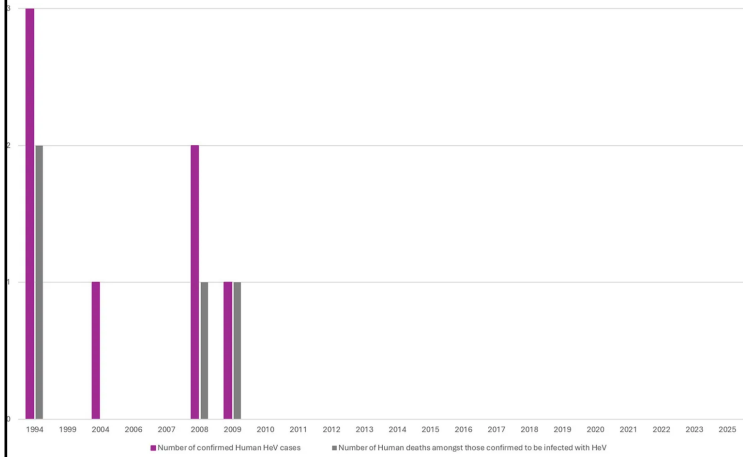
'Pretty devastating': exploring horse owner and veterinarian lived experiences of the equine Hendra virus

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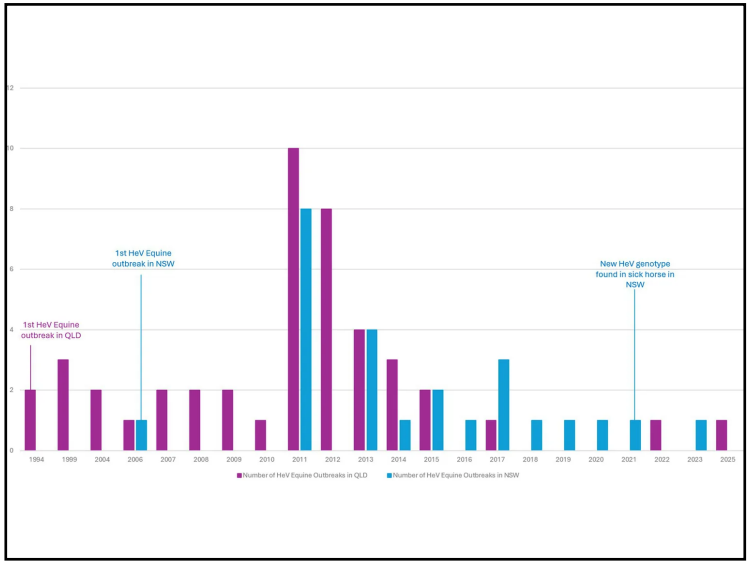


- CSIRO – Commonwealth Scientific and Industrial Research Organisation
- NHMRC – National Health and medical Research Council
- NSW – New South Wales
- QLD – Queensland,
- WHS – Workplace Health and Safety

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Emerg Infect Dis. 2010 Feb;16(2):219–223. doi: 10.3201/eid1602.090552

Human Hendra Virus Encephalitis Associated with Equine Outbreak, Australia, 2008

Elliott G Playford [1,2,3,4,5,6,✉], Brad McCall [1,2,3,4,5,6], Greg Smith [1,2,3,4,5,6], Vicki Slinko [1,2,3,4,5,6], George Allen [1,2,3,4,5,6], Ina Smith [1,2,3,4,5,6], Frederick Moore [1,2,3,4,5,6], Carmel Taylor [1,2,3,4,5,6], Yu-Hsin Kung [1,2,3,4,5,6], Hume Field [1,2,3,4,5,6]

Keywords: Hendra virus, Henipavirus, Paramyxoviridae, ribavirin, Australia, encephalitis, equines, viruses, research

Abstract

A recent Hendra virus outbreak at a veterinary clinic in Brisbane, Queensland, Australia, involved 5 equine and 2 human infections. In contrast to previous outbreaks, infected horses had predominantly encephalitic, rather than respiratory, signs. After an incubation period of 9–16 days, influenza-like illnesses developed in the 2 persons before progressing to encephalitis; 1 died. Both patients were given ribavirin. Basal serum and cerebrospinal fluid levels were 10–13 mg/L after intravenous administration and 6 mg/L after oral administration (isolate 90% inhibitory concentration 64 mg/L). Both patients were exposed to infected horses, 1 during the late incubation period in a horse. The attack rate for veterinary clinic staff exposed to infected horses was 10%. An isolate from this outbreak showed genetic heterogeneity with isolates from a concurrent, but geographically remote, outbreak and from previous outbreaks. Emergence of Hendra virus is a serious medical, veterinary, and public health challenge.

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