E-ISSN: 3025-6437
International Journal of Health Sciences
Vol. 3 Issue 3 (2026) May

Community Transmission of Hantavirus: A Case Analysis of the 2026 Cruise Ship Outbreak on the MV Hondius and Its Global Epidemiological Implications

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Submission date: 30/05/2026; Date received: 31/05/2026

Abstract

Hantaviruses are rare but deadly zoonotic viruses with a case fatality rate (CFR) of up to 50% in the Americas. The hantavirus outbreak on the cruise ship MV Hondius in May 2026 demonstrates the complexity of community transmission in confined environments. This study analyzes patterns of community transmission of hantaviruses based on a WHO report of a cluster of cases on a cruise ship that resulted in 7 cases and 3 deaths. Analytical methods include a comprehensive literature review of global epidemiological data from 2020 to 2025, an analysis of Andes virus transmission patterns in Argentina, and an evaluation of the international public health response. Results indicate that limited human-to-human transmission of the Andes virus strain creates unique potential risks in confined environments such as cruise ships. Global data indicate 229 cases and 59 deaths in the Americas in 2025, with a CFR of 25.7%. The MV Hondius case underscores the need for more stringent surveillance protocols for travel to endemic areas and the development of rapid response capacity for outbreaks in isolated environments. Recommendations include improving pre-departure screening, implementing early detection systems, and developing specific guidelines for the management of hantavirus outbreaks in international transport.

Keywords: hantavirus, community transmission, Andes virus, cruise ships, public health.

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Introduction

Hantaviruses are a group of RNA viruses in the Hantaviridae family that cause serious human disease with varying clinical manifestations across geographic regions. In the Americas, hantaviruses cause Hantavirus Cardiopulmonary Syndrome (HCPS) or Hantavirus Pulmonary Syndrome (HPS), with a very high case fatality rate of up to 50%. This contrasts with Europe and Asia, where Hemorrhagic Fever with Renal Syndrome (HFRS) has a lower CFR of 1-15%.

Hantavirus transmission generally occurs through inhalation of aerosols from infected rodent excreta. However, the Andean strain of the virus, endemic to South America, exhibits unique characteristics, including limited human-to-human transmission through close and prolonged contact. This phenomenon was first reported in El Bolsón, Argentina, in 1996 and has been the focus of epidemiological research for nearly three decades.

A hantavirus outbreak on the cruise ship MV Hondius in May 2026 provides new insights into the dynamics of community transmission in a closed and isolated environment. The ship, which departed from Ushuaia, Argentina, with 147 passengers and crew from 23 countries, experienced a cluster of cases, resulting in seven suspected and confirmed cases and three deaths between April and May 2026.

Global Epidemiology of Hantavirus

WHO data indicate that an estimated 10,000–100,000 hantavirus infections occur annually worldwide, with the largest burden in Asia and Europe. In the Americas region, eight countries reported 229 cases and 59 deaths in 2025 through epidemiological week 47, with a CFR of 25.7%. In the European region, 1,885 hantavirus infections were reported in 2023 (0.4 per 100,000 population), marking the lowest rate between 2019 and 2023.

In East Asia, particularly China and the Republic of Korea, HFRS still accounts for thousands of cases annually, although incidence has declined in the past decade. In the United States, since surveillance began in 1993, a total of 890 cases of hantavirus disease had been reported by the end of 2023, with over 90% of cases occurring in the region west of the Mississippi River.

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International Journal of Health Sciences
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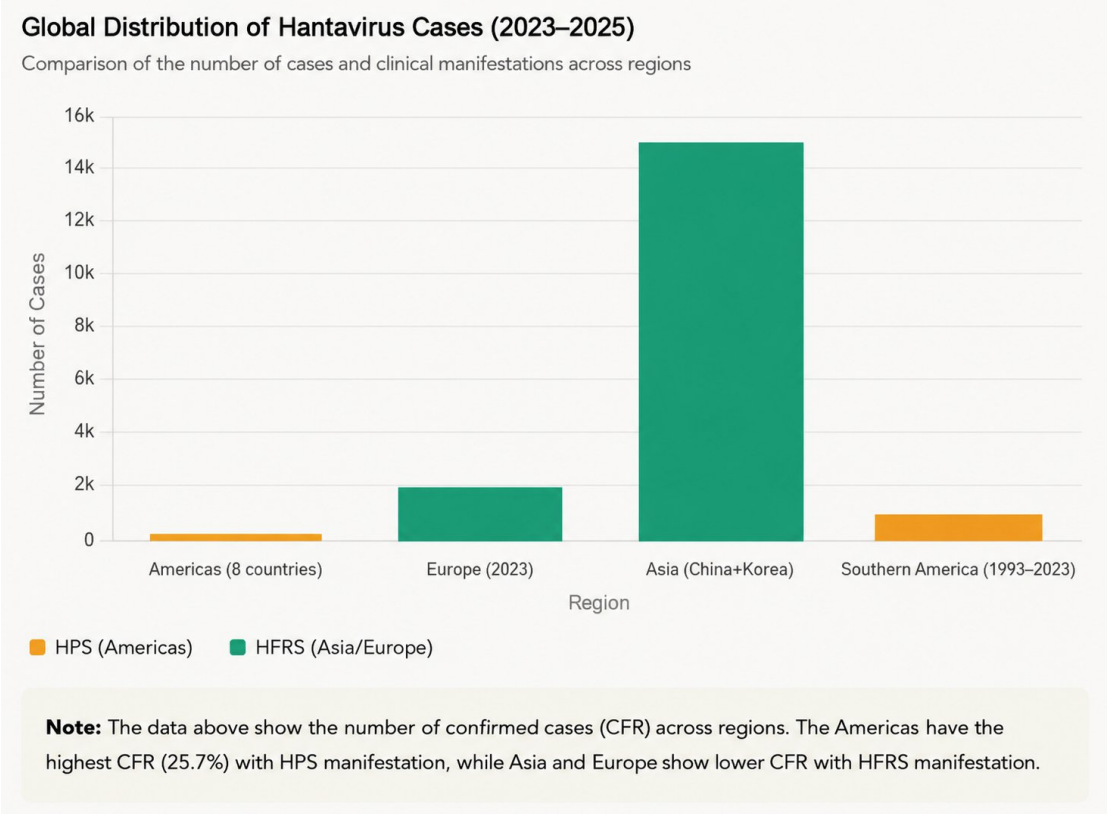

[FIGURE 1: Global Distribution of Hantavirus Cases 2023-2025]
Figure 1. Global distribution of hantavirus cases (2023-2025) by region. Asia has the highest case burden of HFRS manifestations, while the Americas has the highest CFR of HPS manifestations.

Transmission Characteristics of Andes Virus

Andes virus (ANDV) is the only hantavirus consistently transmitted between humans. The first evidence of person-to-person transmission was reported in the 1996 El Bolsón outbreak, which involved 18 cases, including three doctors treating HPS patients. The case of a doctor in Buenos Aires who became ill 27 days after treating a patient from the outbreak area provides strong evidence of human-to-human transmission.

Genomic analysis indicates that the Andes virus strain has genetic characteristics that allow for limited human-to-human transmission. The 2018-2019 Epuyén outbreak in Chubut Province, Argentina, resulted in 34 confirmed cases and 11 deaths, with clear evidence of person-to-person transmission. The reproductive number (R_0) was 2.12 before the implementation of control measures and decreased to 0.96 after case isolation and contact quarantine.

Recent research has identified the concept of "super-spreaders" in ANDV

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International Journal of Health Sciences
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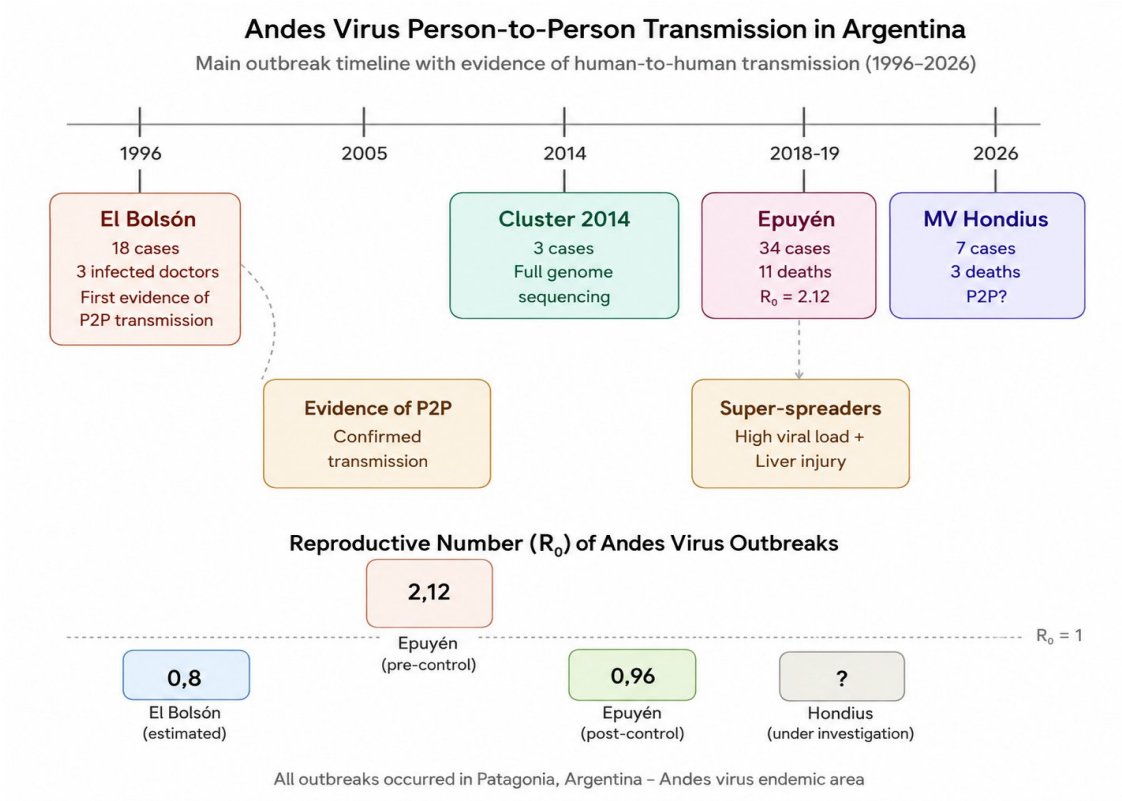
transmission, where patients with high viral loads and liver damage are more likely to transmit the virus. Full genome sequencing of 27 patients in the Epuyén outbreak showed that the strain involved (Epuyén/18-19) was similar to the strain responsible for the first person-to-person transmission (Epilink/96) in El Bolsón in 1996.



[FIGURE 2: Timeline of Person-to-Person Transmission of Andes Virus Argentina]

Figure 2. Timeline of major Andes virus outbreaks with evidence of human-to-human transmission (1996–2026). The graph shows the evolution of understanding of person-to-person transmission and the identification of super-spreaders.

Transmission in a Closed Environment

Research on hantavirus transmission in confined environments is limited. A 2012 case in Yosemite National Park infected 10 people, resulting in three deaths, but showed no evidence of human-to-human transmission. Outbreaks in healthcare facilities have also been reported, but are rare when appropriate infection prevention and control measures are implemented.

Cruise ship environments have unique characteristics that can facilitate transmission: high passenger density, limited ventilation, communal activities, and limited access for medical evacuation. These factors can create optimal conditions for

transmission amplification if the pathogen is introduced.

Table 1. Comparison of Clinical Manifestations of HPS and HFRS

Aspect	HPS (Americas)	HFRS (Asia/Europe)
Manifestation	Acute pulmonary syndrome	Hemorrhagic fever with renal syndrome
Pathogenesis	Pulmonary capillary leakage, pulmonary edema, Acute Respiratory Distress Syndrome (ARDS)	Renal dysfunction, thrombocytopenia
Mortality	Very high (25–50%)	Moderate (1–15%)
Major Strains	Andes, Sin Nombre	Puumala, Hantaan, Seoul
The case of the MV Hondius 2026	*A CFR of 43% (3 of 7 cases) is consistent with HPS caused by the Andean strain of the virus. This mortality rate supports the hypothesis that the outbreak was caused by a strain with South American pathogenicity characteristics.*	

Source: Data compiled from WHO, CDC reports, and epidemiological publications 2020-2025

Method

This study used a descriptive analytical approach with secondary data from:

- The official WHO situation report on the MV Hondius hantavirus outbreak
- The 2020-2025 global hantavirus surveillance database
- A literature review of cases of person-to-person transmission of Andes virus
- An analysis of the international public health response

The analysis included:

- Temporal and geographic patterns of transmission
- Demographic and clinical characteristics of cases
- Effectiveness of public health response measures
- Comparison with previous hantavirus outbreaks.

Results & Disscussion

Characteristics of the MV Hondius Outbreak

The cruise ship MV Hondius departed Ushuaia, Argentina, on April 1, 2026, with an itinerary that included Antarctica, South Georgia, Nightingale Island, Tristan da Cunha, Saint Helena, and Ascension Island. A total of 147 individuals, including 88 passengers and 59 crew members from 23 countries, were on board.

The first case (Case 1) was an adult male who developed fever, headache, and mild diarrhea on board the ship on April 6, 2026. On April 11, the case developed

respiratory distress and died on board the same day. No microbiological examination was performed.

The second case (Case 2), an adult female who was a close contact of Case 1, disembarked on Saint Helena on April 24, 2026, with gastrointestinal symptoms. Her condition worsened during the flight to Johannesburg on April 25, and she died shortly after arriving at the emergency department on April 26. PCR confirmation of hantavirus was obtained on May 4.

Cases 1 and 2 had traveled in South America, including Argentina, before boarding the ship on April 1, 2026, suggesting possible pre-departure exposure.

The third case (Case 3) was an adult male who presented to the ship's doctor on April 24, 2026, with fever, shortness of breath, and signs of pneumonia. His condition worsened on April 26, and he was evacuated to South Africa on April 27. PCR testing confirmed hantavirus infection on May 2, 2026.

The fourth case (Case 4) was an adult female who presented with pneumonia and died on May 2, 2026. Symptoms began on April 28 with fever and general malaise. Three suspected cases with high fever and/or gastrointestinal symptoms remained on board and were evaluated by the Cabo Verde medical team.

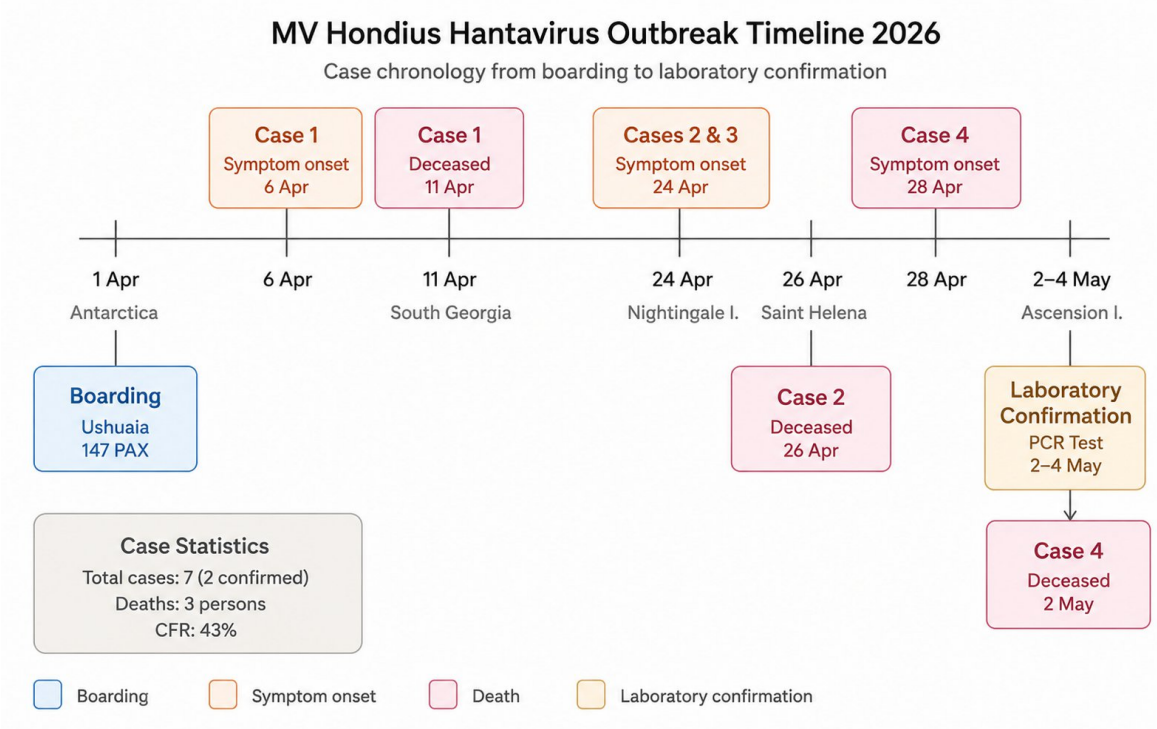


Figure 3. Chronology of cases from boarding to laboratory confirmation. The timeline shows 7 cases with 3 deaths, a CFR of 43%, over 22 days.

Transmission Pattern Analysis

The symptom onset period was between April 6 and 28, 2026, characterized by fever, gastrointestinal symptoms, rapid progression to pneumonia, acute respiratory distress syndrome, and shock, consistent with the classic clinical manifestations of HPS. The interval between the first case (April 6) and the last case (April 28) was 22 days, well within the hantavirus incubation period of 2-8 weeks. However, temporal and spatial clustering within the ship's environment suggests the possibility of secondary transmission.

Contact tracing for passengers on the flight that Case 2 boarded from Saint Helena has been initiated, demonstrating awareness of the potential for person-to-person transmission, although rare.

Exposure Source Hypothesis

Epidemiological investigations identified three hypothetical sources of exposure:

1. Exposure in Argentina/South America before departure – supported by the travel histories of Cases 1 and 2 and the onset of symptoms in Case 1 on day 5 after departure, consistent with pre-departure exposure.
2. Exposure on one or more remote islands during the voyage – the ship's itinerary included remote, ecologically rich environments with significant rodent populations.
3. Rodent infestation on the ship itself – possible contamination of the ship's environment with infected rodent excreta.

Mapping of the viral genomic sequence is ongoing and will be crucial in determining the geographic origin of the strain based on genetic fingerprinting.

Public Health Response

WHO activated three-tier coordination and supported national authorities in implementing risk-based and evidence-based public health measures in accordance with the International Health Regulations (IHR).

Response measures included:

- Coordination between participating countries (Cabo Verde, the Netherlands, Spain, South Africa, and the United Kingdom)

- Global information sharing through IHR National Focal Points
- Maximum physical distancing and cabin isolation for passengers
- Epidemiological investigation to determine the source of exposure
- Logistical support, including sample collection materials
- Laboratory testing and confirmation at the National Institute for Communicable Diseases (NICD) in South Africa
- Additional laboratory samples sent to the Institut Pasteur de Dakar, Senegal
- Medical team evaluation and evacuation support.

Implications for Global Risk Management

The case of the MV Hondius highlights the unique vulnerability of international modes of transport to emerging infectious diseases. Confined environments with high population densities, limited ventilation, and limited access to medical evacuation create conditions that can amplify transmission. Although the WHO assesses the global risk as LOW, this case demonstrates the need for:

- Enhanced pre-travel screening for destinations in hantavirus-endemic areas
- Improved rodent control measures at ports and on ships
- Strengthened infection prevention protocols for modes of transport
- Rapid response capacity for outbreak investigations in isolated environments
- An international coordination mechanism for health emergencies in international waters.

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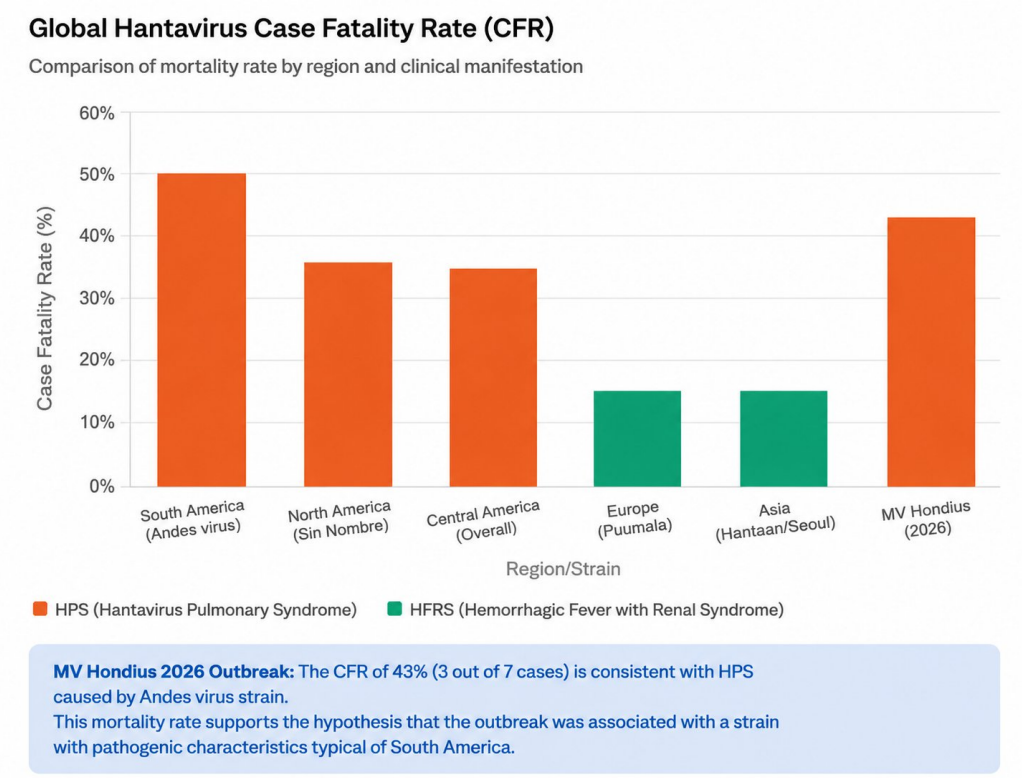

[FIGURE 4: Global Hantavirus Case Fatality Rate (CFR)]
Figure 4. Comparison of global hantavirus case fatality rates by region and strain. The CFR of MV Hondius (43%) is consistent with the manifestation of the Andean strain of HPS virus.

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