

Hantavirus: Update on Outbreaks from the Four Corners to the MV Hondius

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Submitted: 8 July 2026, accepted: 8 July 2026, published: 30 September 2026

Abstract: The two forms of hantavirus infection include Old World, characterized by hemorrhagic fever with renal syndrome (HFRS), and New World, manifested by hantavirus pulmonary syndrome (HPS). In Chile and Argentina, HPS is caused by Andes virus (ANDV) which can be spread from human to human via droplets or aerosols and has led to several outbreaks. Superspreaders appear to play an important role in outbreak amplification. In North America, Sin Nombre virus is the causative organism and is not transmitted between humans. HPS is manifested by fulminant pulmonary edema without vasculitis, often associated with thrombocytopenia. A cruise ship outbreak of ANDV infection aboard the MV Hondius in 2026, likely caused by human-to-human transmission, led to 34 cases and 11 deaths. ANDV infection has an incubation period of up to 40 days; thus, exposed persons should be quarantined for up to 6 weeks. Health care workers are at risk for nosocomial infection and should use appropriate personal protective equipment, respiratory protection, eye covering, and double gloving, to reduce their risk for disease.

Keywords: hantavirus; ANDV; Hondius

How to cite: McKinsey, D. Hantavirus: Update on Outbreaks from the Four Corners to the MV Hondius. *Priv. Pract. Infect. Dis.*, 2026, 6(3): 10; doi:[10.55636/ppid06030010](https://doi.org/10.55636/ppid06030010).

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Highlights

- Hantaviruses are spherical, enveloped RNA viruses of the family Bunyaviridae, with more than 40 species identified worldwide.
- Old World hantaviruses cause hemorrhagic fever with renal syndrome (HFRS); New World hantaviruses cause hantavirus pulmonary syndrome (HPS).
- In the United States, Sin Nombre virus causes a rare, geographically clustered form of HPS concentrated in the western states and is not transmitted from person to person.

- Andes virus (ANDV) in South America is the only hantavirus documented to spread directly between people, and superspreaders may be a decisive factor in outbreaks.
- A 2018 to 2019 ANDV outbreak in Chubut Province, Argentina, produced 34 infections and 11 deaths through documented person-to-person transmission.
- A 2026 outbreak aboard the expedition cruise ship MV Hondius produced 13 cases and three deaths and appears to be winding down following quarantine and isolation.
- Nosocomial transmission of Andes virus to healthcare personnel has been documented only where personal protective equipment was absent or inadequate, underscoring the need for prompt transmission-based precautions.
- The mean incubation period for HPS is approximately 21 to 27 days (ranging from 9 to 40 days), and both Sin Nombre and Andes viruses carry high mortality.

1. Introduction

Hantaviruses are rodent-borne RNA viruses that cause two distinct and frequently severe clinical syndromes in humans. Although human infection is uncommon, the high case fatality associated with these viruses, together with the recognition that at least one species can spread directly from person to person, has kept hantavirus among the more closely watched emerging zoonotic threats [1]. Recent events, including a large person-to-person outbreak in Argentina and a 2026 outbreak aboard the expedition cruise ship MV Hondius, have renewed clinical and public health interest in this group of pathogens. This review summarizes the history, virology, clinical manifestations, and epidemiology of hantavirus infection, with emphasis on the distinct behavior of the New World viruses and the lessons of recent outbreaks.

2. Historical Background

Hantavirus disease was first described on a large scale during the Korean conflict in the early 1950s, when approximately 3000 United Nations troops developed an acute febrile illness with renal involvement. The causative agent eluded identification for more than two decades and was finally isolated in 1978 near the Hantaan River, from which the prototype virus and the broader genus take their name [2].

The New World form of hantavirus disease was not recognized until 1993, during the Four Corners outbreak in the southwestern United States, where the borders of Utah, Colorado, New Mexico, and Arizona meet. That cluster was notable for its severity, with 17 out of 33 identified patients dying, and led to the identification of Sin Nombre virus as the agent of a previously uncharacterized, rapidly progressive pulmonary syndrome [3].

3. Virology and Classification

Hantaviruses are spherical, enveloped, single-stranded RNA viruses belonging to the family Bunyaviridae [4]. The family encompasses a diverse group of arthropod- and rodent-borne agents, including the California encephalitis viruses, Rift Valley fever virus, Crimean–Congo hemorrhagic fever virus, sandfly fever virus, Oropouche virus, Heartland virus, and Dabie bandavirus. More than 40 distinct hantaviruses have been identified worldwide [5]. In contrast to most other members of the family, hantaviruses are maintained in rodent reservoirs rather than transmitted by arthropod vectors, and each virus is generally associated with a specific host species.

4. Clinical Manifestations

Hantavirus infection produces two broad clinical syndromes that correspond to the geographic origin of the infecting virus.

Old World disease: hemorrhagic fever with renal syndrome. The Old-World hantaviruses, including Hantaan, Dobrava, Seoul, and Puumala viruses, cause hemorrhagic fever with renal syndrome (HFRS). Hantaan virus is found in Korea, China, and eastern Russia; Dobrava virus circulates in the Balkans; Seoul virus is distributed worldwide, with the notable historical exception of the United States; and Puumala virus, which causes milder illness, is found in Europe. Infection follows inhalation of aerosols derived from the striped field mouse and other rodent reservoirs, and the clinical picture is characterized by fever, shock, bleeding, and renal failure [6].

New World disease: hantavirus pulmonary syndrome. The New World hantaviruses, principally Sin Nombre virus in North America and Andes virus (ANDV) in South America, cause hantavirus pulmonary syndrome (HPS). Infection is acquired through inhalation of aerosolized mouse saliva, urine, or feces. After a febrile prodrome, patients develop shock and a fulminant increase in pulmonary vascular permeability that occurs without vasculitis. The diagnosis should be considered in any otherwise healthy person who develops pulmonary edema or acute respiratory distress syndrome, and thrombocytopenia is an important early diagnostic clue. Deterioration can be abrupt, and death often occurs within 24 to 48 hours of hospitalization [6].

5. Prevalence and Distribution in the United States

HPS remains rare in the United States. Surveillance data compiled for the period from 1993 through 2018 show that annual case counts have generally ranged from fewer than 10 to fewer than 50, with a substantial proportion of cases proving fatal [7]. Cumulative case counts reported by the Centers for Disease Control and Prevention through 2023 demonstrate a pronounced geographic concentration in the western states. New Mexico (129 cases), Colorado (121 cases), Arizona (92 cases), California (79 cases), and Washington (61 cases) account for the largest reported burdens, consistent with the distribution of the deer mouse reservoir of Sin Nombre virus. Cases east of the Mississippi are uncommon, and many states report few or no cases [8].

Two features of United States hantavirus disease are clinically important: it is geographically restricted to regions where the rodent reservoir is endemic, and Sin Nombre virus is not transmitted from person to person.

6. The Argentine Outbreak, 2018 to 2019: Person-to-Person Transmission and Superspreaders

The capacity of certain New World hantaviruses to spread directly between people was demonstrated definitively during an outbreak of ANDV-associated HPS in Chubut Province, Argentina, between November 2018 and February 2019. The outbreak resulted in 34 confirmed infections and 11 deaths [1].

The chain of transmission was reconstructed in detail. The index patient attended a birthday party with approximately 100 guests while symptomatic. Five persons who had been seated close to the index patient became ill 17 to 24 days after the party. One of these (Patient 2) transmitted the infection to six additional persons and died 16 days after symptom onset. The spouse of Patient 2 (Patient 9) was febrile while attending her husband's wake, and 10 persons who attended the wake subsequently became ill 14 to 40 days afterward. Infection was thought to be transmitted through respiratory droplets or aerosolized virions [1].

Epidemiologic analysis revealed the central role of superspreaders [1]. Among 33 cases for which transmission could be characterized, 10 were spreaders, and 23 were non-spreaders; transmission occurred in four successive waves, and just three cases accounted for 64 percent of all transmissions. The estimated median weekly R_0 was 6.56 (95 percent confidence interval, 2.55 to 13.51) and fell markedly once control measures were implemented. The mean incubation period in this outbreak was 22.9 days (standard deviation 4.8 days). These findings support isolation of infected patients, quarantine of exposed asymptomatic contacts, and the use of personal protective equipment by healthcare workers, including respiratory protection, eye protection, and double gloving [1].

The risk of nosocomial transmission to healthcare personnel has been examined directly. A 2026 systematic review of healthcare-associated ANDV exposure identified seven exposure events in healthcare settings involving 118 exposed healthcare personnel, among whom eight became infected, and four died; in every reported instance of healthcare-personnel infection, personal protective equipment was either not used or inadequate [9]. Reported transmission to healthcare personnel has occurred in the setting of delayed implementation of transmission-based precautions or breaches in infection control practice, reinforcing the importance of early isolation and the consistent use of appropriate personal protective equipment when caring for patients with suspected or confirmed ANDV infection [9].

7. The MV Hondius Cruise Ship Outbreak, 2026

The Andes virus is hosted by the long-tailed colilargo, also known as the long-tailed pygmy rice rat, and is acquired by inhalation of rodent excreta. In Argentina, approximately 100 cases of HPS are reported each year, with mortality ranging from 21 to 50 percent, and roughly 1500 cumulative cases have been recorded in Chile. Critically, ANDV is the only hantavirus for which person-to-person spread has been documented [1].

The most recent ANDV outbreak occurred aboard the expedition cruise ship MV Hondius. A published timeline of the first 10 cases documented symptom onset, laboratory confirmation, and outcome for each patient, with the earliest case occurring in early April 2026. The ship carried 147 people, comprising 88 passengers and 59 crew members from 23 countries [10]. A total of 13 cases were identified, including eleven laboratory-confirmed and two probable infections, with three patient deaths. A 42-day quarantine period was subsequently completed, and more than 600 contacts were placed under monitoring, none of whom developed hantavirus infection after a 2-month follow-up period [11].

8. Conclusions

Sin Nombre virus is the predominant agent of HPS in the United States. It is concentrated in the western states, is rare, and is not contagious. The Andes virus, by contrast, circulates in South America and is the only hantavirus for which person-to-person transmission has been documented; superspreaders may be an important factor in ANDV outbreaks [1]. Across recent outbreaks, the mean incubation period has been approximately 21 to 27 days, with a range of 9 to 40 days. Both Sin Nombre and Andes viruses cause hantavirus pulmonary syndrome and are associated with high mortality. The MV Hondius outbreak appears to have ended [11]. For the clinician, the central messages are to consider HPS in any previously healthy patient who presents with a febrile prodrome followed by rapidly progressive pulmonary edema and thrombocytopenia, particularly in the setting of relevant rodent or epidemiologic exposure, and especially in patients with a history of recent travel to the western United States, Argentina, or Chile.

Funding: This research received no external funding.

Acknowledgments: The authors used Claude for content assistance, specifically to create an initial draft from prior personal presented material. The manuscript was reviewed and the authors revised the material generated and take full responsibility for the content of this publication.

Conflicts of Interest: The author declares no conflict of interest.

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