

Is Hantavirus a growing global threat requiring renewed warning?

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ABSTRACT

Hantaviruses pose a renewed global threat. While the pandemic risk appears low, as transmission typically begins with rodent exposure and sustained human spread requires prolonged close contact, outbreaks like the 2026 MV Hondius cluster demonstrate that localized spillovers can escalate into international public health events. To address existing surveillance gaps before future spillover events, occur, integrated One Health frameworks that combine rodent genomic biomonitoring, climate modeling, and standardized diagnostic testing are essential. This article aims to provide a brief overview of hantaviruses as major global public health threats, along with their epidemiology and pathogenesis.

Keywords: Hantaviruses, Emerging pathogen, Global threat, Virus, Zoonotic

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Introduction

Hantaviruses are emerging rodent-borne zoonotic pathogens belonging to the genus Orthohantavirus within the family Hantaviridae [1,2]. Hantaviruses are increasingly recognized as emerging pathogens of significant global concern, driven by ecological disruption, climate variability, and modern global connectivity [3,4,5]. While classical transmission occurs via aerosolized rodent excreta, international travel networks and the documented human-to-human transmissibility of the South American Andes virus have amplified public health vigilance [4, 6]. Severe disease is driven by endothelial dysfunction, vascular leak, and thrombocytopenia, and management remains largely supportive because no broadly licensed antiviral or vaccine exists outside limited inactivated vaccine use in China and South Korea [4,5,7]. Early critical care, especially ECMO for fulminant cardiopulmonary syndrome, improves survival, while next-generation diagnostics, monoclonal antibodies, and mRNA or other platform vaccines remain active development priorities [4,7,8]. Overall, hantavirus appears closer than many surveillance systems assume not because it is poised for efficient pandemic spread, but because ecological change, underrecognition, and global travel are increasing the chance that severe local spillovers will generate cross-border emergencies, making integrated One Health surveillance and preparedness an urgent priority [3,4,6].

Changing Epidemiology and the Travel Interface

Hantaviruses were historically split geographically between Old World strains causing hemorrhagic fever with renal syndrome (HFRS) in Eurasia and New World strains causing hantavirus cardiopulmonary syndrome (HCPS) in the Americas [4,9,10]. However, clinical manifestations have increasingly blurred, showing overlapping pulmonary and renal pathologies across varied rodent, insectivore, and bat hosts [5,10]. In Eurasia, HFRS causes roughly 150,000 to 200,000 annual cases, primarily driven by Hantaan, Dobrava-Belgrade, and Seoul viruses [10,11]. In contrast, New World infections carry severe mortality rates ranging from 30% to 50% broad geographical distribution and diverse rodent host reservoirs illustrate these evolving boundaries across continen [11,12].

Following the April 2026 epidemic on board the cruise ship MV Hondius, which began in Ushuaia, Argentina, and affected passengers from 23 different countries, the recognized boundaries of regional containment changed [3,13]. The cluster demonstrated that terrestrial rural exposures can quickly spread into international contact networks, as evidenced by its 38% case fatality rate [12,13]. This incident highlighted significant surveillance gaps in European and international transit networks, where natural species like the *Puumala* virus were previously thought to be harmless [14,15].

Clinical Pathogenesis and Critical Countermeasures

Acute endothelial barrier breakdown caused by vascular endothelial growth factor hyper-sensitization, systemic inflammatory cascades, and severe thrombocytopenia are the hallmarks of severe illness [4,5,7]. After an initial febrile prodrome, clinical deterioration usually occurs quickly, leading to circulatory collapse or non-cardiogenic pulmonary edema [13,16]. Instead of assuming self-management, individuals who appear with an unexplained acute febrile respiratory or renal illness after traveling to a rural area need to be evaluated by a competent clinician.

- Intensive critical care: Early initiation of extracorporeal membrane oxygenation (ECMO) achieves nearly 80% survival in fulminant cardiopulmonary failure [4,12,17]

- Antiviral limitations: Ribavirin demonstrates clinical benefit in early HFRS, but no specific antiviral therapy is proven effective for HCPS [4,17,18].
- Vaccine pipeline: While neutralizing monoclonal antibodies and mRNA vaccine candidates are still in translational development, only China and South Korea have licensed inactivated vaccines [10, 19, 20].

Conclusion

Because severe illness, growing ecology, and human transmission of the rare Andes virus now converge with climate change and international mobility, hantavirus requires more global preparedness. The areas of greater consensus are the increasing spillover events and existing gaps in surveillance. In contrast, the issue of persistent person-to-person transmission occurring outside of Andes virus clusters remains a more limited and less significant concern.

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