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Opinion

Hantavirus Infection: Recent Outbreaks and Emerging Public Health Challenges

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Hantaviruses are rodent-borne viruses that can infect humans and cause severe, sometimes fatal disease. In the Americas, they can cause hantavirus cardiopulmonary syndrome (HCPS), affecting the lungs and heart, while in Europe and Asia they can cause haemorrhagic fever with renal syndrome (HFRS), affecting the kidneys and blood vessels. There is no specific cure, but early supportive medical care improves survival. Prevention focuses on avoiding contact with infected rodents[1].

Hantaviruses are viruses in the Hantaviridae family that naturally infect specific rodent species without causing disease in them. Only a few hantaviruses cause illness in humans. In the Americas, they can cause hantavirus cardiopulmonary syndrome (HCPS), and Andes virus can rarely spread between close human contacts. In Europe and Asia, hantaviruses cause haemorrhagic fever with renal syndrome (HFRS), with no confirmed human-to-human transmission[2,3].

Hantavirus infections are uncommon but can be severe, with fatality rates of less than 1.0% to 15.0% cases in Asia and Europe and up to 50.0% in the Americas. An estimated 10,000 to 100,000 infections occur worldwide each year, mainly in Asia and Europe. While HFRS is more common in Asia and Europe, HCPS is rarer in the Americas but has a high fatality rate of 20.0% to 40.0% cases[2].

Hantaviruses spread to humans through contact with infected rodent urine, droppings, saliva, or bites, especially during activities like cleaning rodent-infested areas, farming, or forestry work. Human-to-human transmission is very rare and has only been documented with Andes virus in the Americas through close, prolonged contact[3,4].

Hantavirus primarily infects endothelial cells in the lungs and kidneys, disrupting blood vessel integrity and causing vascular leakage, fluid accumulation, and organ failure. Disease severity is thought to result from a combination of viral effects and the host immune response, although the exact mechanism remains unclear. Neutralizing antibodies play a key protective role by reducing disease severity and providing long-lasting immunity, while T cells appear to contribute mainly to viral clearance rather than causing tissue damage[5].

Hantavirus infection can cause two severe diseases like Haemorrhagic Fever with Renal Syndrome (HFRS) and Hantavirus Cardiopulmonary Syndrome (HCPS).

Haemorrhagic Fever with Renal Syndrome (HFRS): After an incubation of 10 days to 6 weeks, symptoms begin with fever, headache, muscle pain, and abdominal pain, followed by low blood pressure, bleeding, and kidney damage. Severity varies by virus, with fatality rates ranging from less than 1.0% to 10.0% cases.

Hantavirus Cardiopulmonary Syndrome (HCPS): After an incubation of 1 to 5 weeks, patients develop fever, muscle aches, headache, and gastrointestinal symptoms, which can rapidly progress to severe breathing difficulty, pulmonary edema, shock, and heart failure. Fatality rates are

20.0% to 40.0%, and most deaths occur within the first 48 hours of severe illness[1,2].

Early diagnosis of hantavirus infection is difficult because its symptoms resemble other febrile and respiratory illnesses. A thorough patient history, including rodent exposure, occupational and environmental risks, travel, and possible contact with infected individuals, is essential[2].

Laboratory confirmation is based on hantavirus-specific IgM or rising IgG antibodies, or RT-PCR to detect viral RNA during the acute phase. Patient samples should be handled as biohazards under appropriate biosafety conditions and transported using the triple packaging system.

In April–May 2026, a multi-country outbreak of Andes hantavirus was identified among passengers and crew aboard the MV *Hondius* expedition cruise ship after its voyage from Argentina. As of mid-May 2026, 10 cases (8 laboratory-confirmed) and 3 deaths had been reported. Unlike most hantaviruses, Andes virus has the rare ability to spread through close person-to-person contact, prompting international contact tracing and quarantine measures. The World Health Organization, Centers for Disease Control and Prevention, and European Centre for Disease Prevention and Control coordinated surveillance and response. By late June 2026, no sustained community transmission had been detected, and the public health risk outside exposed contacts remained low[7].

There is no specific antiviral treatment or vaccine. Early diagnosis, intensive supportive care, and prompt management of complications greatly improve survival[3]. Hantavirus prevention focuses on reducing contact with rodents by keeping environments clean, sealing entry points, storing food safely, using safe cleaning methods for contaminated areas, and practicing good hand hygiene. During outbreaks, early case detection, isolation, contact monitoring, and standard infection prevention measures help reduce transmission[2,4]. The risk of healthcare-associated hantavirus transmission is very low when appropriate infection prevention and control measures are followed. Standard precautions should be used for all patients, with additional transmission-based precautions for suspected or confirmed cases and airborne precautions during aerosol-generating procedures. Early recognition, prompt isolation, and strict infection control help protect healthcare workers[8].

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