

Hantavirus outbreak on a cruise vessel: a Day 3 update with epidemiological and clinical considerations in 10 key points

1. A recurring epidemiological pattern

Maritime settings have historically facilitated the introduction and amplification of infectious diseases. The current situation involving the MV *Hondius*, with multiple suspected hantavirus infections among passengers confined at sea, illustrates once again the vulnerability of closed, mobile populations to emerging zoonotic infections. Such scenarios echo earlier port-associated epidemics and highlight persistent challenges in maritime public health management.

2. Two distinct hantavirus syndromes

Hantaviruses are classically divided into two clinical-epidemiological entities:

- Old World hantaviruses, associated with hemorrhagic fever with renal syndrome (HFRS), are generally of moderate severity in Europe (e.g., Puumala virus).
- New World hantaviruses, responsible for hantavirus pulmonary syndrome (HPS), are characterised by rapid respiratory deterioration and high case fatality rates (up to 30–50%).

3. A shared zoonotic reservoir

All hantavirus infections originate from rodent reservoirs, with species-specific virus-host relationships. Human infection occurs through inhalation of aerosolised viral particles from contaminated rodent excreta (urine, faeces, saliva). Human infection is typically incidental and non-sustained.

4. Probable involvement of a New World hantavirus

Given the geographic origin of the voyage (Argentina) and the reported severity of cases, a New World hantavirus, most plausibly Andes virus, should be considered. This virus is endemic in southern South America and is a known cause of HPS.

5. Low but documented risk of human-to-human transmission

Unlike most hantaviruses, Andes virus has been associated with limited human-to-human transmission, particularly in close-contact settings. While rare, this transmission route must be considered in cluster investigations, especially in confined environments such as ships.

6. Incubation period consistent with pre-boarding exposure

The incubation period of hantavirus infection ranges from 1 to 4 weeks, with reported extremes up to 6–8 weeks. This allows for the possibility that initial infections occurred prior to embarkation, particularly in endemic areas of Patagonia, with subsequent symptom onset during the voyage.

7. Absence of specific antiviral therapy

There is currently no established specific antiviral treatment for HPS. Management remains supportive and includes advanced critical care measures such as mechanical ventilation and

extracorporeal membrane oxygenation (ECMO) in severe cases. Ribavirin has not demonstrated consistent efficacy in this clinical presentation.

8. Lack of available vaccination strategies

No licensed vaccines are currently available for prevention of hantavirus infections in this context. Preventive strategies rely exclusively on exposure control and environmental measures.

9. Three epidemiological scenarios

A. Common-source exposure prior to embarkation

A shared environmental exposure in an endemic region (e.g., Patagonia) could explain initial cases. However, the temporal distribution of cases may be difficult to reconcile with a single exposure event.

B. Ongoing environmental exposure onboard

The possibility of a contaminated environment within the vessel (e.g., rodent infestation in technical areas or storage compartments) should be considered, although this would require confirmation through environmental investigation.

C. Secondary human-to-human transmission

Limited person-to-person transmission, particularly if involving the Andes virus, could account for a staggered onset of cases and clustering patterns. **Importantly, this scenario is not mutually exclusive with the two previous hypotheses** and may coexist with either a common-source exposure before embarkation or ongoing environmental exposure onboard. This hypothesis requires confirmation through molecular epidemiology (sequencing).

10. Implications for international health regulations and response

This situation falls within the scope of the International Health Regulations (IHR 2005), necessitating coordinated international response, including risk assessment, case management, contact tracing, and decisions regarding port access and medical evacuation. The event underscores the operational and ethical challenges of managing infectious disease outbreaks in isolated maritime settings.

Conclusion

This outbreak highlights the intersection of zoonotic spillover, constrained environments, and global mobility. It reinforces the need for rapid diagnostic capabilities, coordinated international response, and improved understanding of hantavirus transmission dynamics, particularly in atypical settings.

Sources

<https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON599>

World Health Organisation. *International Health Regulations (2005)*. 3rd ed. Geneva: WHO; 2016.