

Re-emergence Risk of Crimean–Congo Hemorrhagic Fever in Iran: A Persistent Zoonotic Threat Requiring Strengthened One Health Surveillance

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Dear Editor,

Crimean–Congo hemorrhagic fever (CCHF) remains one of the most significant zoonotic viral threats in the Middle East, with Iran recognized as an endemic country. Caused by a tick-borne Nairovirus (family *Nairoviridae*), CCHF is primarily transmitted through bites of *Hyalomma* ticks or via contact with blood or tissues of infected livestock. The case-fatality rate in humans ranges from 5% to 40%, depending on outbreak context and healthcare capacity [1-3].

In Iran, the risk of CCHF is higher in settings characterized by frequent human–animal contact, extensive livestock movement, and ecological conditions favorable for *Hyalomma* ticks, particularly in border and southeastern areas. Given Iran's proximity to endemic neighboring countries such as Pakistan, Afghanistan, Iraq, and Turkey, the risk of transboundary circulation of CCHF virus should not be overlooked [4-6]. This underscores the need for coordinated regional surveillance and information sharing. Since the first confirmed cases in Iran in 1999, sporadic outbreaks have been reported annually, particularly in southeastern and western provinces [7]. Occupational groups such as slaughterhouse workers "24 hours freezing after slaughtering and fully industrial slaughterhouses", farmers, and healthcare personnel remain at elevated risk [7].

Notably, climate variability may further expand tick habitats and prolong transmission seasons. Changes in temperature and humidity influence vector survival and viral replication dynamics, potentially increasing outbreak frequency [7]. Moreover, asymptomatic infection in livestock complicates early detection and facilitates silent viral circulation within animal reservoirs.

Currently, no widely approved, specific antiviral therapy with proven efficacy exists for CCHF; ribavirin has been used empirically, but robust randomized clinical trial evidence remains limited [7]. Likewise, no globally licensed human vaccine is available, underscoring the importance of preventive strategies.

Given these circumstances, strengthening integrated surveillance under a One Health framework is imperative. Measures should include: (i) enhanced tick and livestock monitoring, (ii) molecular surveillance for enabling early detection of viral circulation,

monitoring genetic variation and genomic characterization of circulating strains, (iii) improved infection prevention and control practices in healthcare settings, and (iv) regulation of livestock movement across borders. Regional collaboration within the Eastern Mediterranean area is also essential to mitigate transboundary transmission.

In conclusion, CCHF represents a persistent and potentially expanding zoonotic threat in Iran. Proactive, coordinated surveillance integrating veterinary and human health sectors is critical to prevent larger outbreaks and reduce mortality.

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