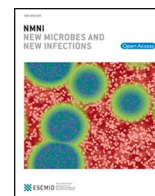


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# New Microbes and New Infections

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## Letter to the Editor

### Nepal's Japanese encephalitis outbreak and the urgent need for updated vaccination guidelines

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#### Dear Editor

Nepal is experiencing a significant outbreak of Japanese encephalitis (JE), with 63 confirmed cases and 17 fatalities reported since June 2024 [1]. Alarmingly, the outbreak has extended into the Kathmandu Valley—an area at 5000 feet elevation where JE-carrying *Culex* mosquitoes were previously considered unlikely [2]. This raises concerns for travelers visiting both urban and rural regions of Nepal. Authorities estimate that 12 million residents are at risk, and the one million international visitors expected in 2024 may face increased exposure due to the expanded distribution of cases.

JE is transmitted through bites from infected *Culex* species mosquitoes. Pigs and certain birds act as amplifier hosts, maintaining high viral loads that facilitate transmission. Humans are dead-end hosts, not carrying sufficient viral loads to infect mosquitoes. While most infections are asymptomatic or mild, less than 1 % progress to encephalitis. The disease has a case-fatality rate of 20–30 %, and 30–50 % of survivors suffer long-term neurological complications. Symptoms appear 5–15 days post-infection and include high fever, headache, neck stiffness, disorientation, seizures, and paralysis. There is no specific antiviral treatment; care is supportive.

Traditionally, JE vaccination hasn't been routinely recommended for short-term travelers to Nepal, especially those visiting urban areas or trekking at high elevations [3]. The current outbreak challenges this view. Detection of JE cases in Kathmandu suggests urban travelers may now be at risk. Individuals over 25 years old are equally susceptible and may have higher mortality rates [2]. The virus appears to have moved from the Terai region into hilly areas like Kathmandu [1,2], likely due to climate change, urbanization, increased population density, and favorable mosquito breeding conditions [2,3].

Despite JE vaccination being part of Nepal's childhood immunization program since 2016, less than 50 % of infected individuals have been vaccinated [2,3]. The vaccine is administered to children aged 12–23 months, with catch-up vaccination up to five years. Adults who missed vaccination or lack booster doses remain vulnerable. Health officials are seeking additional vaccine supplies from international aid organizations [1], but immediate interventions like targeted vaccination

campaigns in high-risk areas are lacking.

Given the outbreak, there is an urgent need to reassess vaccination recommendations for travelers. The U.S. Centers for Disease Control and Prevention (CDC) currently recommends JE vaccination for travelers spending extended periods in endemic rural areas [4]. However, the increasing presence in urban centers like Kathmandu necessitates updated guidelines. Travelers planning to visit Nepal—especially those engaging in outdoor activities, staying near pigs or birds, or having prolonged stays—should strongly consider JE vaccination regardless of their itinerary. Valneva's inactivated JE vaccine, IXIARO®, approved for individuals aged 2 months and older, has demonstrated high immunogenicity and a favorable safety profile [4].

In addition to vaccination, travelers should employ personal protective measures against mosquito bites: use repellents containing DEET or picaridin, wear long-sleeved clothing and pants, and sleep under insecticide-treated bed nets. Ensuring accommodations have screens on windows and doors can further reduce exposure. Adopting a One Health approach, recognizing the interconnectedness of human, animal, and environmental health, is crucial for addressing zoonotic diseases like JE [5].

In conclusion, the JE outbreak in Nepal underscores the need for adaptive public health strategies. Revising vaccination guidelines for travelers is critical to mitigate this severe disease. Enhanced surveillance, public awareness campaigns, and collaboration between local and international health authorities are essential to control JE and protect both residents and visitors.

#### CRedit authorship contribution statement

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### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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