

# Mosquito-Borne Diseases: Current Overview and Their Impact on Children

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Mosquito-borne diseases continue to pose a significant global health threat, with a disproportionate impact on children [1]. As of 2024, several mosquito-borne illnesses are causing concern worldwide, particularly dengue fever, which has seen a dramatic increase in cases.

The current dengue outbreak is particularly alarming. As of April 2024, over 7.6 million dengue cases have been reported globally, including 3.4 million confirmed cases, over 16,000 severe cases, and more than 3,000 deaths [2]. The Americas have been particularly hard-hit with case numbers exceeding 7 million by the end of April 2024, surpassing the previous annual high of 4.6 million cases in 2023 [3].

In the United States, Puerto Rico declared a dengue outbreak in March 2024, with local transmission also reported in the US Virgin Islands and Florida [3]. This surge in cases has increased the risk for travelers and may lead to small outbreaks in the continental United States.

Dengue fever can affect people of all ages, but children are particularly vulnerable. The disease can cause severe complications in children, including dengue hemorrhagic fever and dengue shock syndrome, which can be life-threatening. Symptoms in children may include high fever, severe headache, pain behind the eyes, muscle and joint pain, and skin rash.

While dengue is currently the most pressing concern, several other mosquito-borne diseases continue to impact children worldwide. Malaria, despite notable progress, remains a major killer, particularly in sub-Saharan Africa, accounting for about 8% of deaths in children under 5 [4]. The West Nile virus has become endemic across the Americas over the past decade; although most cases in children are mild or asymptomatic, severe infections can lead to encephalitis or meningitis [5]. Chikungunya, which originated in the Indian Ocean basin and mainland Asia, now affects millions and can cause high fever, joint pain, and rashes in children [6]. The Zika virus, though less common than before, still poses a risk, especially for pregnant women due to its links to birth defects. Meanwhile, Japanese encephalitis has expanded its reach into the Indian subcontinent and Australasia, primarily affecting young children.

Several factors contributing to the increased spread of

mosquito-borne diseases include climate change and weather phenomena like El Niño and La Niña, leading to conditions favorable for mosquito breeding [5]; the changing distribution and increasing abundance of mosquito vectors; urbanization and population growth in endemic areas; international travel and trade; and changes in circulating virus serotypes affecting population immunity [1].

Mosquito-borne diseases can have severe consequences for children's health and development. When it comes to physical health, severe cases of diseases can lead to hospitalization, long-term complications, and, in the worst scenarios, even death. Beyond the immediate impact on their bodies, children's cognitive development can suffer; for instance, diseases like malaria can impair their ability to think clearly and learn effectively. This, in turn, disrupts their school attendance, causing frequent absences that result in significant academic setbacks over time. The effects extend beyond academics; chronic illness can take a toll on a child's emotional well-being, impacting their mental health and making social interactions more challenging. Families also face an economic burden, as the costs of treatment and the loss of productivity for caregivers can strain their financial resources.

Preventing mosquito bites is essential to shielding children from dangerous diseases. Some key strategies include using insect repellents registered with the Environmental Protection Agency (EPA) that contain N, N-diethyl-meta-toluamide (DEET), picaridin, or oil of lemon eucalyptus. When children are outdoors, it is wise to dress them in long-sleeved shirts and long pants to minimize exposed skin. In areas where mosquito-borne diseases are common, using insecticide-treated bed nets can provide an additional layer of protection while they sleep [1]. Environmental control is also crucial. Eliminating any standing water around homes, where mosquitoes breed, can significantly reduce the risk of mosquito-borne diseases.

Vaccination can also be an important preventive measure. For diseases like Japanese encephalitis, and the newly approved chikungunya vaccine for adults [7], getting vaccinated can be a crucial step in safeguarding health.

In conclusion, mosquito-borne diseases continue to pose a significant threat to global health, with children bearing a disproportionate burden. The current dengue outbreak highlights the need for increased vigilance and coordinated global efforts to control these diseases. Other mosquito-borne diseases that continue to affect children globally include malaria, West Nile virus, chikungunya, Zika virus, and Japanese encephalitis. By implementing comprehensive prevention strategies, enhancing surveillance systems, and investing in research for new treatments and vac-

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cines, we can minimize the impact of these diseases on children's health and well-being. Pediatricians and other healthcare providers, policymakers and parents all have crucial roles to play in protecting children from the dangers of mosquito-borne illnesses.

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### Conflict of Interest

None to declare.

### Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author.

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