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# Chikungunya virus: A global re-emergence and review of the evidence

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## Abstract

Chikungunya fever is a mosquito-borne viral disease that has re-emerged globally in recent decades, causing explosive outbreaks with significant public health impact. In 2025, parts of Southeast Asia and the Indian Ocean islands experienced major chikungunya outbreaks, underlining the continued threat of this arboviral infection. This narrative review aims to provide a comprehensive and up-to-date overview of chikungunya fever, covering epidemiology, pathogenesis, clinical manifestations, diagnosis, comparisons with similar conditions, treatment, and prevention strategies. Relevant literature was identified through database searches and authoritative health organization reports, with emphasis on studies from the last five years. In summary, chikungunya fever remains an important re-emerging disease worldwide. Strengthened surveillance, accurate diagnosis (distinguishing it from co-circulating arboviruses), and integrated mosquito control are vital to mitigate its impact, while new vaccines offer hope for future outbreak prevention.

**Keywords:** Chikungunya Fever; Review; Outbreaks; Diagnosis; Prevention

## 1. Introduction

Chikungunya fever is an acute febrile illness caused by the chikungunya virus (CHIKV), an RNA virus in the genus Alphavirus (family Gaviidae) [1]. The disease is transmitted to humans by *Aedes* mosquitoes (primarily *Aedes Egyptian Aedes albopictus*), the same vectors that spread dengue and Zika viruses [2]. The name "chikungunya" originates from the Kimonoed language of Tanzania, meaning "to become contorted," describing the stooped posture of sufferers with severe joint pain [3]. First identified in Tanzania in 1952, CHIKV caused sporadic outbreaks in Africa and Asia for several decades [4].

Since the mid-2000s, chikungunya has dramatically re-emerged on a global scale. Notably, a mutation in the viral envelope (E1-A226V) enabled CHIKV to be transmitted more efficiently by *Ae. albopictus*, facilitating its spread to new regions [5]. Beginning around 2004–2005, large outbreaks occurred in Kenya and the Indian Ocean islands, including a 2005–2006 epidemic in La Réunion that affected an estimated 244,000–300,000 people [6]. The virus subsequently caused epidemics in South Asia in 2006–2008, and in late 2013 CHIKV reached the Americas [7]. As of 2025, over 110 countries across Asia, Africa, the Americas, and Europe have reported cases [8,9].

In 2025, outbreaks were reported in La Réunion, Mayotte, Mauritius, and southern China. Guangdong province recorded over 7,000 confirmed cases in July to early August 2025 [9]. These events highlight that chikungunya remains a pressing health issue in tropical and subtropical regions. In light of ongoing outbreaks and vaccine development, this article serves as a refresher and aims to consolidate recent evidence for clinicians, researchers, and public health professionals.

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## 2. Methodology

We conducted a narrative review using PubMed, Scopus, and Google Scholar. Search terms included "chikungunya," "CHIKV," "chikungunya fever," "outbreak," "clinical features," "treatment," "diagnosis," and "vaccine." Literature in the last five years from January 2020 to August 2025 was prioritized. Reports from WHO, CDC, ECDC, and national health agencies were also reviewed.

## 3. Epidemiology

Chikungunya was once confined to parts of Africa and Asia. Since 2004, it has expanded into the Americas and Europe [10,11]. Over 110 countries have reported local transmission [8]. A major outbreak occurred in La Réunion in 2005 [6], and a widespread epidemic followed in the Americas in 2013–2014 [12,13]. In 2023, Paraguay experienced a resurgence [14]. In 2025, southern China reported its largest outbreak [9]. Chikungunya outbreaks are explosive, with attack rates exceeding 30% [15]. Immunity after infection appears long-lasting [16]. Transmission peaks during rainy seasons when mosquito density rises [17]. Travelers can introduce the virus to new areas.

## 4. Pathogenesis

CHIKV enters through a mosquito bite, replicates in fibroblasts, and spreads systemically [18]. It targets muscle and joint tissues, leading to inflammation and pain [19]. Most patients recover within two weeks, but 30–50% develop persistent arthralgia due to immune dysregulation or antigen persistence [20,21]. Chronic arthritis resembles rheumatoid arthritis but usually lacks autoantibodies [22]. Severe cases involving the heart, brain, or liver are rare and occur mostly in infants and elderly adults [23,24]. The case fatality rate remains under 0.3% [25].

## 5. Clinical Manifestations

Typical features include abrupt onset of high fever, severe polyarthritis or arthralgia, rash, and fatigue [26]. Joint pain affects small joints symmetrically and may persist for weeks or longer [27]. Rash, headache, conjunctivitis, and mild bleeding can also occur [28]. As indicated in Table 1, the initial clinical presentation of Chikungunya fever may resemble that of other viral infections, such as dengue or Zika virus. Laboratory findings include leukopenia, mild thrombocytopenia, and elevated liver enzymes [29]. Chronic joint pain can persist beyond 3 months, especially in older adults [22]. Severe complications include encephalitis, seizures, and myocarditis [24].

**Table 1** Comparison of Chikungunya, Dengue, and Zika Infections

| Feature | Chikungunya | Dengue | Zika |
|---|---|---|---|
| Fever | High, abrupt | High, biphasic | Mild or absent |
| Arthralgia/Arthritis | Severe, persistent | Mild | Mild |
| Rash | Common | Common | Common |
| Hemorrhagic tendency | Rare | Common in severe cases | Rare |
| Conjunctivitis | Uncommon | Uncommon | Common |
| Thrombocytopenia | Mild | Marked | Mild |
| Chronic sequelae | Common | Rare | Rare |

## 6. Diagnosis

RT-PCR detects viral RNA in blood during the first 7 days of illness [30]. Afterwards, serology is preferred; IgM antibodies appear by day 5 and persist for weeks. IgG indicates past exposure. In regions with dengue and Zika co-circulation, differential diagnosis is essential. Dengue often causes bleeding and low platelets, while Zika may present with milder symptoms and conjunctivitis [28].

## 7. Treatment

There is no specific antiviral treatment for chikungunya. Management is primarily supportive. Paracetamol is recommended for fever and pain relief. Aspirin and NSAIDs should be avoided initially to rule out dengue, which may co-circulate [3,8]. Once dengue is excluded, NSAIDs can be used to control inflammation. Chronic arthralgia may require a longer course of NSAIDs or corticosteroids, especially in severe or disabling cases [21,22]. Some patients benefit from physiotherapy during the chronic phase. Methotrexate or other DMARDs may be considered for persistent inflammatory arthritis resembling rheumatoid arthritis, although evidence is limited [20,21].

## 8. Prevention

Several prevention strategies are indicated in Table 2. Vector control remains the cornerstone of chikungunya prevention. This includes eliminating mosquito breeding sites, using insect repellents (e.g., DEET, picaridin), wearing protective clothing, and installing window screens [8,10]. Community engagement in sanitation efforts is essential to reduce Aedes populations. Travelers to endemic areas should take strict mosquito bite precautions. During outbreaks, infected individuals should avoid mosquito exposure to prevent further spread [8].

A single-dose, live-attenuated chikungunya vaccine (IXCHIQ/VLA1553) [31] for intramuscular injection was developed by Valneva and received approval in Europe, the United States, Canada, and the United Kingdom, for use in travellers aged 18 and older [32,33,34,35]. In 2024, Valneva received $41.3 million grant to support broader access to the vaccine, and to evaluate its effectiveness in vulnerable groups, such as children and pregnant women [36]. A safe, effective, and widely available vaccine could significantly reduce the global disease burden.

**Table 2** Key Prevention Strategies for Chikungunya

| **Strategy** | **Description** |
|---|---|
| Vector control | Remove standing water, larvicides, fogging |
| Personal protection | Repellents, long clothing, mosquito nets |
| Surveillance and outbreak response | Early case detection and rapid mosquito control |
| Public education | Community awareness on prevention |
| Vaccination (future) | VLA1553 vaccine approved; others in development |

## 9. Conclusion

Chikungunya fever continues to pose a significant public health challenge across endemic and newly affected regions. Its expanding geographic range, debilitating chronic symptoms, and absence of targeted antiviral therapy highlight the need for continued surveillance, prompt diagnosis, and effective vector control strategies. Recent progress in vaccine development offers hope for long-term prevention. Greater public awareness, health system readiness, and investment in research are essential to mitigate the impact of future outbreaks and reduce the disease burden globally.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

The author declares no conflict of interest.

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