



History

Chikungunya is an arboviral disease transmitted by mosquitoes. It was first identified during an outbreak in southern Tanzania in 1953 and was later described by Marion Robinson and Lumsden in 1955, following an outbreak on the Makonde Plateau near the border of Tanganyika and Mozambique. The term "chikungunya," derived from East African languages, refers to the "bent-over" posture caused by the severe joint pain characteristic of the disease.

In Sri Lanka, the first chikungunya epidemic was reported in the early 1960s, followed by decades of quiescence. The virus re-emerged in November 2006 after a 40-year absence, across various parts of the island. Between 2006 and 2007, an estimated 40,000 individuals were affected, with a similar number of cases recorded in 2008.

Transmission

Chikungunya spreads to humans through bites from infected female mosquitoes, primarily *Aedes aegypti* and *Aedes albopictus*. These mosquitoes are also vectors for other mosquito-borne illnesses, such as dengue. While they bite throughout the day, activity peaks in the early morning and late afternoon. Symptoms of chikungunya typically appear 4–8 days after being bitten by an infected mosquito, though the incubation period can range from 2 to 12 days. Mother-to-fetus transmission is possible between 3 and 4.5 months of pregnancy, as well as vertical transmission during near-term deliveries with intrapartum viremia.

Disease vectors

The mosquitoes *Aedes aegypti* and *Aedes albopictus* are key vectors for chikungunya involving in larger outbreaks.

- **Aedes aegypti:** Found in tropical and subtropical areas, this species thrives near human settlements and prefers indoor breeding sites like flower vases, water storage containers, and concrete tanks.
- **Aedes albopictus:** Found not only in tropical and subtropical areas but adaptable to a broader range of habitats, including temperate and cold temperate regions. In recent decades it has spread from Asia to parts of Africa, Europe, and the Americas. This species breeds in many natural and artificial water-filled habitats such as tree holes, coconut husks, bamboo stumps, cocoa pods, rock pools, and discarded tires. It is commonly found in rural and peri-urban areas, as well as shaded urban parks.

Other mosquito species, including the *A. furcifer-taylori* group and *A. luteocephalus*, have also been linked to chikungunya transmission in Africa.

Reservoir

Humans act as reservoirs for the chikungunya virus during outbreaks. Outside of epidemics, other vertebrates, such as monkeys, rodents, birds, and small mammals, serve as reservoirs. Outbreaks have been reported among monkeys when herd immunity is lower.

Infectious Agent

Virus causing chikungunya is an RNA virus belonging to the *alphavirus* genus of the *Togaviridae* family.

Symptoms

The disease is characterized by:

- A sudden onset of fever, often reaching 39°C, sometimes accompanied by chills or tremors.
- Joint pain (arthralgia) or swelling (arthritis), especially in small joints like the wrists, hands, ankles, and feet, though larger joints may also be affected.
- A petechial or maculopapular rash, typically on the trunk and limbs but sometimes affecting the face, palms, and soles.
- Additional symptoms include muscle pain, headache, fatigue, and nausea.

While most patients recover fully, some experience persistent joint pain lasting months or even years. Rarely, complications involving the eyes, nervous system, gastrointestinal tract, or heart occur. Deaths are uncommon but may occur in infants and children particularly with high fever, prolonged convulsions and neurologic defects suggesting a primary encephalitis.

Diagnosis of Chikungunya

Laboratory findings commonly observed in Chikungunya infection include:

1. **Mild leukopenia** with relative lymphocytosis.
2. **Elevated ESR**, typically between 20–50 mm/h.
3. **Positive C-Reactive Protein** levels.
4. **Decreased platelet count**, often accompanied by hemorrhagic manifestations.
5. **ECG changes** indicative of myocarditis.

Differential diagnosis should consider conditions that may present similarly to Chikungunya, such as Parvovirus infection, Hepatitis B prodrome, Juvenile Rheumatoid Arthritis, Dengue and Rubella.

Specific Diagnostic Tests

Chikungunya patients are typically viremic for the first 48 hours, during which the virus can be isolated using both in vivo and in vitro methods. Viraemia levels can be measured using **Hemagglutination** or **ELISA** (serum). As viraemia declines, titers of **hemagglutination inhibition (HI)** and **neutralizing antibodies** rise.

1. **Virus isolation** from serum 1 to 2 days after illness onset.
2. **Antigen detection** via ELISA (less sensitive than serology).
3. **Antibody detection** from serum, typically detectable 5 days after onset

Chikungunya-specific IgM antibody testing is available at the Medical Research Institute (MRI), Colombo. Medical and field staff should send blood samples from all suspected cases. During an epidemic, confirmatory tests may not be required if an epidemiological link is established.

Treatment

There is no specific antiviral treatment for chikungunya. Management focuses on relieving symptoms:

- Antipyretics and analgesics for fever and pain relief.
- Paracetamol or acetaminophen is preferred until dengue is ruled out, as NSAIDs may increase bleeding risks.
- Adequate hydration through sufficient fluid intake.
- Rest and mild exercises to alleviate joint stiffness.
- There is no specific antiviral drug treatment for chikungunya virus infections.

Chikungunya outbreak management: Surveillance, Preparedness and Response

Case Definitions

Healthcare staff should be familiar with standardized case definitions for Chikungunya:

Suspected Case: A patient presenting with acute onset fever (lasting 3–5 days), often with chills/rigors, and accompanied by multiple joint pains or extremity swelling, which may persist for weeks to months.

Probable Case: A suspected case with any of the following:

- a) History of travel to or residence in areas with reported Chikungunya outbreaks.
- b) Exclusion of malaria, dengue, or other known causes of fever with joint pains.
- c) Presence of post-infection hyperpigmented rash.

Confirmed Case: A patient with one or more of the following findings, regardless of clinical presentation:

- a) Virus isolation in cell culture or animal inoculations from acute-phase serum.
- b) Detection of viral RNA in acute-phase serum.
- c) Seroconversion to virus-specific antibodies in paired samples collected 1–3 weeks apart.
- d) Detection of virus-specific IgM antibodies in a single serum sample collected after 5 days of illness onset.

Hospital-Based Surveillance and Notification

Chikungunya is not routinely notifiable; however, clustering of suspected cases should trigger immediate notification. Once an outbreak is identified.

- Fever surveillance should be initiated in the hospital OPD.
- Consultant Physicians and Consultant Pediatricians should ensure case reporting.
- Medical staff in the OPD and wards should notify suspected Chikungunya cases using the standardized notification form (H-544) to the relevant Medical Officer of Health (MOH) until further notice.
- Laboratories are required to report positive test results.
- A special case investigation form for Chikungunya must be completed for all clinically diagnosed and/or serologically confirmed cases and sent to the Epidemiology Unit. The Infection Control Nursing Officer in the hospital should assist with this activity.

Field-Based Preventive Measures

Pre-Outbreak Preparedness

Preventive health sectors should begin preparedness activities 2–3 months before the rainy season, focusing on:

- Convening District Health Committees to plan response strategies.
- Strengthening entomological surveillance to monitor vector density as an early warning.
- Establishing rapid response teams for outbreak investigations.
- Engaging community leaders, representatives, and NGOs to promote social mobilization.
- Assessing hospital disaster preparedness, including resources for manpower, insecticides, and fogging equipment.
- Preparing and distributing educational materials (IEC) to raise public awareness.

Actions During an Outbreak

- The MOH must initiate preventive measures and supervise field investigations and preventive actions by the Public Health Inspector (PHI).
- The PHI should conduct field investigations for notified cases, identify potential mosquito breeding sites, and implement mosquito population control measures.
- Effective outbreak response includes daily case reporting, investigation of deaths, regular media briefings, and mobilizing resources to match epidemic trends.

Community Role in Outbreak Control

Community involvement is critical for Chikungunya control and prevention:

- **Household level:** Eliminate mosquito breeding sites, use mosquito repellents, wear protective clothing, use bed nets, apply pyrethroid-based aerosols during peak mosquito activity, equip accommodations with screens or nets to block mosquitoes, and avoid mosquito bites during the first week of illness to prevent virus spread
- **Institutional level:** Schools, hospitals, and workplaces should educate on prevention, adopt household-level measures, and ensure compliance
- **Community level:** Mobilize groups for sanitation drives, conduct house-to-house inspections, and advocate for civic authority action on environmental management

Key Interventions

- **Vector Control:** Source reduction, fogging, ULV spraying, larvicides, and larvivoracious fish.
- **Social Mobilization:** Promote sanitation and vector control by engaging local communities.
- **Surveillance:** Monitor and report cases, investigate trends, and track deaths during outbreaks.
- **Communication:** Use media to raise public awareness and provide accurate information.

Effective community involvement, robust surveillance, and proactive vector control are crucial to containing Chikungunya outbreaks.