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Chikungunya Epidemic on La Reunion Island

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Abstract

Reunion Island, a French department located in the Indian Ocean, has just experienced, during the year 2025, a major chikungunya epidemic, with more than 54,500 cases recorded, requiring 554 hospitalizations, including 153 serious cases resulting in the 45 deaths. Severe cases were more frequent in young children and the elderly with longer hospital stays in patients over 65 years of age. The cause of death was primarily cardiac and respiratory failure. Chikungunya is a tropical arboviral disease caused by an RNA virus transmitted by *Aedes* mosquitoes. The reservoirs are monkeys and certain mammals, in humans, the disease manifests itself after a few days of incubation with a flu-like syndrome: high fever, intense arthralgia, myalgia, headache, and maculopapular rash. The progression can be rapid and favorable within a week or become chronic with persistent arthralgia lasting several months or years. Neurological and cardiac complications are possible. The mortality rate is low (1/1000). Diagnosis is confirmed by virus testing in the first week and then by serology. Prevention is based on mosquito control and vaccination.

Keywords: Chikungunya, *Aedes*, Tropical fever, Arthralgia, Mosquito control, La Reunion island, Vaccination

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Introduction

Reunion Island is a French department of 2,500 km2, located in the Indian Ocean, east of Africa and 80 km southeast of Madagascar (Figure 1). It is a volcanic island with a still active volcano, the Piton de la Fournaise, at a height of 2,630 meters. It has a tropical climate, with an average temperature of 18°C to 22°C, a rainy season from January to March and a dry season from March to November. The island is covered with tropical forests. The population (885,000 inhabitants) originating from many countries, is very diverse and the different ethnic groups live in good neighborliness.

La Réunion has just experienced a major chikungunya epidemic, during the year 2025, with more than 54 500 cases recorded. An epidemic had already affected this island in 2005 with more than 250,000 cases, or 38% of the population (with 203 deaths), and then no cases had been reported since 2010, until August 2024 (1). But the virus had not disappeared. Indeed, epidemics occurred in 2013 and 2014 in the Caribbean. The first locally acquired case appeared in Italy in 2007, in the south of France in 2010 (2) and in the United States 2014. The risk of the disease spreading throughout France is significant given the increasing presence of the tiger mosquito in the country. Chikungunya has been a notifiable disease in France since 2008.

Cases presentation

In a medical center in La Réunion island, a 17-year-old boy consulted for unusual asthenia, a fever of 38°C, and pain in his wrists and ankles. A diffuse maculopapular rash appeared on the 5th day after the onset of symptoms. An initial laboratory assessment found a CRP of only 9.2, with tests for dengue and chikungunya viruses being negative. Then the symptoms regressed. But 3 weeks later, the pain reappeared in the toes and wrists. This time, the CRP was 10.3 mg/L, the AST was 51U/L, the ALT was 60U/L, and the dengue test was negative, but the RT-PCR for chikungunya was positive. Treatment was symptomatic only.

It is interesting to note that this patient's cautious mother was vaccinated with the Ixchik© vaccine, which caused some myalgia and arthralgia with cutaneous hyperesthesia, which disappeared within 2 days.

A 50-year-old woman, recently returned from Réunion Island, presented with unusual fatigue accompanied by headaches, diffuse arthralgia and myalgia, a moderate fever of 38°C, and a diffuse erythematous rash. Clinical examination was unremarkable. Chikungunya virus was detected by RT-PCR, while dengue remained negative. The blood count shows leukopenia (2,300 WBC/mm3) and the CRP is 47 mg/L. The patient was placed on bed rest and treated with paracetamol. Two weeks later, testing for chikungunya antibodies showed the following results: dengue IgG and IgM antibodies: negative; but chikungunya IgG: 2 and IgM: 2.5 (threshold 1.5; EIA Euroimmun reagent).

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Figure 1. La Reunion Island is near Madagascar

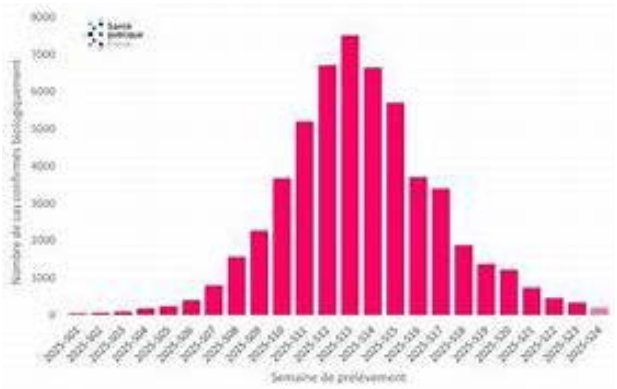

Figure 2. La Reunion: a major chikungunya epidemic during the year 2025

Table 1. Characteristics of hospitalized patients, including severe cases (* average length of hospital stay) (adapted from 3)

	Hospitalized cases	Severe cases
Number of cases	554	138
Sex-ratio M/F	0,9	1,7
Average age	66 (1 d – 106 d)	73 (1 d – 96 d)
hospital stay*	4 j (2 d – 77 d)	5 j (2 d – 50 d)
Age < 6 months	12%	16%
Pregnant women	26%	1%
Age > 65 years	52%	67%

Discussion

Reunion Island has just experienced a major chikungunya epidemic, during the year 2025 (Figure 2) with more than 54,500 cases recorded, requiring 554 hospitalizations, including 153 serious cases resulting in 45 deaths (including 2 newborns). Severe cases were more frequent in young children and the elderly people with comorbidities (Table 1). At the peak of the epidemic, there were 7500 reported cases in 1 week. A more detailed analysis of the cases identified four groups of patients based on age, with longer hospital stays in patients over 65 years of age (Table 2), along with the causes of death, which was primarily cardiac and respiratory failure (Table 3). At the end of the epidemic (December 2025), the local population exhibited high overall immunity (66%), with variations across regions (from 58.1% to 74.3%). These results give hope for a limitation of the risk of a new epidemic during the southern summer of 2026, which does not, however, eliminate the appearance of a few sporadic cases (3).

Chikungunya is a tropical infectious disease caused by the chikungunya virus, an alphavirus of the Togaviridae family. This disease is so debilitating that patient stand bent over due to the pain, hence the name "chikungunya", which means "curled up" in the Swahili language of Tanzania, where this virus was present (4). The first case was described in this country in 1952, where there are many outbreaks in rural areas. But it seems that epidemics had previously occurred in India and attributed at the time to dengue fever (5).

A vector mosquito

Transmission is carried out by the bite of a female mosquito (*Aedes aegypti* and *Aedes albopictus* called "tiger mosquito" because of the white and black features on the legs), with diurnal activity (especially early in the morning and at the end of the day) and well adapted to human habitat (6) (Figure 3). The female needs hemoglobin for egg maturation. The chikungunya virus is a rounded, 70 nanometer RNA virus that has unreliable polymers responsible for many mutations (Figure 4) (7). The mosquito becomes infected by absorbing blood from a contaminated man or animal (Figure 5). Indeed, in the viremic phase, humans can harbor up to 1012 copies of virus per milliliter of blood and therefore constitute a virus reservoir. In the mosquito, the virus crosses the stomach wall and reaches the salivary glands where it will be inoculated, after about ten days, during the next blood meal, and this mosquito will remain infesting for its entire life, i.e. about a month (8). Transmission being vertical, the female will lay every 4 days, or around 300 eggs in her life, but only 1 to 2% will be infected. The male, feeding on plant nectars, never bites men or animals. There is no direct transmission between humans, except in exceptional cases of blood transfusion. This virus is present in 119 countries, in Africa, America, the Indian Ocean (9) and Asia (10), where animal reservoirs are numerous: monkeys, bats, pigs, small mammals (Figure 6). More and more cases are being diagnosed in Europe. In 2024, the WHO has recorded nearly 450,000 cases worldwide, mainly in Brazil (11).

A flu syndrome

Around 20% of infected subjects remain asymptomatic. In other cases, after an incubation of 4 to 7 days, the patient suddenly complains of a fever of 39°C, headaches, myalgia and diffuse arthralgia (12), explaining his curled position seeking an analgesic situation. A diffuse maculopapular rash is common (Figure 7), sometimes with conjunctivitis (13), digestive disorders (14,15) and hemorrhages (especially gum bleeding) (Figure 8) (16) (Table 4). The progression can then be towards rapid healing in around ten days or towards prolonged damage from 3 weeks, with persistent pain, requiring "morning relief". Convalescence is sometimes quite long (several

Table 2. Analysis of hospitalized chikungunya cases, according to patient age (adapted from 3)

	<6 monhs	from 6 months to 65 years old	>65 years old	Pregnant women
Number of cases	66	56	290	142
Sex-ratio M/F	2	1,5	1.6	-
Average age	48 d (1d – 159d)	54 y (7m – 64y)	78 y (65y -101y)	29 y (16y – 44y)
hospital stay*	4 d (2d- 16d)	5 d (2d – 50d)	5 d (5d – 77d)	3 d
reason for hospitalization	GH □ 52% Pain 23% Rash 95%	GH □ 25% organic deficiencies 23%	GH □ 44% organic deficiencies15%	Fever 71%
comorbidity	mother-to-child transmission: 2 cases	HBP 50% Diabetes 27 % Obesity 23%	HBP 67% Diabetes 42% kidney failure 27%	Obesity 6%

(*average length of hospital stay; GH □: decline in general health; HBP: high blood pressure)

Table 3. Study of deaths due to chikungunya (adapted from 3)

	% (45 cases)
Male	62%
Female	38%
Average age	81 y (40 - 95 y)
Hospital stay	15 d (1d – 66 d)
Causes of death:	-
Cardiovascular	23%
Respiratory	21%
Neurological	12%
Hemorrhagic	9%
Hepatic insufficiency	5%
Renal insufficiency	5%

Figure 3. *Aedes albopictus,* or « tiger mosquito »

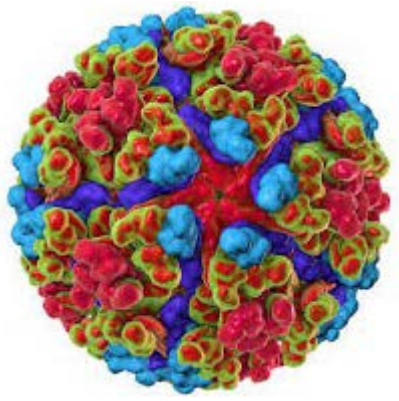

Figure 4. Chikungunya virus

Figure 5. Global distribution of the chikungunya virus

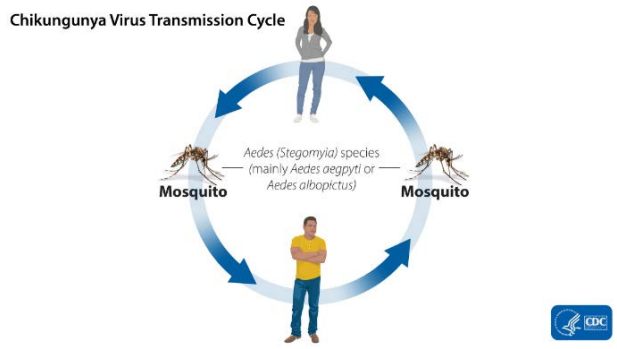

Figure 6. Transmission of the Chikungunya virus

Figure 7. Maculopapular rash

weeks) with persistent asthenia and disabling painful arthropathies (17). Patients can complain of pain in 80% of cases for 3 months, in 57% for 15 months and another 47% after 2 years (18), allowing the use of the term "chronic form" (19), causing musculoskeletal and neuropsychiatric disorders, requiring multidisciplinary

Figure 8. Main symptoms of chikungunya

Table 4. Main symptoms of chikungunya (adapted from 1)

Symptoms	%
Average age	46,3 y old
Joint pain	96,2 %
Fever	96,2 %
Anorexia	62,1 %
Headache	51,2 %
Abdominal pain	35 %
Rash	23,7 %
Diarrhea	22,5 %
Shortness of breath	17,5 %
Vomiting	11,2 %

Table 5. Evolutionary diagram of chikungunya

Acute stage	Post-acute stage	Chronic stage
Days 1 to 21	Days 21 to 3 months	Days 21 to 5 years
25% asymptomatic	50% asymptomatic	57% asymptomatic
Febrile arthralgia	Headache, myalgia, Rash, nausea	Asthenia Polyarthralgia

care (Table 5). During the 2013 epidemic in Guadeloupe, there were 160,000 cases, of which 20,000 were chronic (20).

In children, the symptoms are more like a flu syndrome with digestive disorders, while joint pain is uncommon (21). In pregnant women the passage of the virus is possible in utero, especially in the event of delivery in the viremic phase (22, 23), the newborn may present with fever, lethargy, sucking problems, and long-term neurological disturbances (24). But several cases of in utero deaths have already been reported. In case of breast-feeding, the milk must be boiled before giving it to the child (25). Patients at risk are essentially infants who "refuse" food, the elderly who may present with global insufficiency, as well as diabetics and other subjects suffering from comorbidities which may decompensate for their pathologies. Neurological complications are possible but rare (encephalopathy) (26) as Guillain-Barré syndrome (27). Mortality is estimated on average at 0.4%

Figure 9. Insecticide spraying

Figure 10. The chikungunya vaccine

(28, 29), but at 2.8% among children and 1.6% among the elderly.

The differential diagnosis arises with influenza, malaria, leptospirosis, dengue fever and more rarely with meningitis or septicemia. In addition to the epidemiological and clinical context, serodiagnosis is possible with detection of IgM from the 5th day then IgG from the 15th day which will persist throughout life, with a protective effect. In addition, RT-PCR can be used from the start of infection and during the first week.

Prevention: mosquito repellent and vaccination

Treatment is only symptomatic (rest, oral hydration, analgesics, antipyretics, avoiding NSAIDs) with recourse to hospitalization in intensive care in the event of severe infection. Prevention is based on protection against mosquito bites: repellents, long and light-colored clothing, impregnated mosquito nets, elimination of stagnant water: vases, flower pot saucers, old tires, gutters, tree hollows, and insecticides spraying (Figure 9) (30, 31).

A vaccine is now available (32), approved by the European Medicines Agency since June 2024 (33). For people traveling to endemic areas (34), the vaccination is recommended in people aged in people aged 18 to 64 y with a comorbidity (35), including pregnant women, but not over 65y because of some side-effects are possible. The IXCHIK© vaccine (Figure 10), already recommended in the United States since 2023 (36, 37), induces an immune response in 98.2% of people vaccinated for at least 2 years (38-40). The side effects are minimal and transient (local pain, fever, and headache). However, like all live attenuated vaccines, it is not recommended in immunocompromised

subjects (41-44).

Conclusion

The chicungunya virus, discovered in East Africa, quickly spread throughout tropical and then temperate regions such as North America and Europe. It occurs in major epidemics, such as the current outbreak in La Réunion, with more than 54 500 cases and 43 deaths. It is therefore important to strengthen mosquito control and promote vaccination.

Authors' Contribution

Conceptualization: Patrice Bourée
Data curation: Parice Bourée, Deborah Dumazedier
Formal analysis: Patrice Bourée, Yagoob Garedaghi
Funding acquisition: Patrice Bourée, Yagoob Garedaghi
Investigation: Parice Bourée, Deborah Dumazedier
Methodology: Yagoob Garedaghi
Project administration: Patrice Bourée
Supervision: Patrice Bourée, Yagoob Garedaghi
Validation: Patrice Bourée
Visualization: Patrice Bourée, Yagoob Garedaghi
Writing-original draft: Parice Bourée, Deborah Dumazedier
Writing-review & editing: Patrice Bourée, Yagoob Garedaghi

Competing Interests

None.

Ethical Approval

Written informed consent was obtained from the patients for the publication of these clinical cases.

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