Epidemiological Alert Chikungunya and Oropouche in the Americas Region

28 August 2025

During 2025, outbreaks of chikungunya have been reported in several regions of the world, including Europe and Asia, some of them large in scale. In the Americas Region, several countries have reported an increase in cases. In addition, autochthonous cases of Oropouche continue to be reported in six countries in the Region, including areas outside the historical zones of transmission. Given this situation, the Pan American Health Organization/World Health Organization (PAHO/WHO) urges Member States to strengthen epidemiological and laboratory surveillance, ensure adequate clinical management, and reinforce vector control actions for these two diseases in order to mitigate the risk of outbreaks and reduce complications and deaths.

Summary of the global situation of chikungunya

Globally, since the first detections and as of December 2024, autochthonous transmission of chikungunya virus (CHIKV) has been documented in 119 countries and territories in the six regions of the World Health Organization (WHO). In 27 other countries and territories, established and competent populations of the *Aedes aegypti* vector have been identified, although no autochthonous cases of CHIKV have yet been documented *(1)*.

Additionally, in countries where *Aedes albopictus* has become established, this vector may present greater competition for transmission, especially against virus genotypes containing the E1-A226V mutation, characteristic of the Indian Ocean lineage (IOL), which significantly increases transmission efficiency. The presence of these vector populations represents a continuing risk of introduction and spread of CHIKV in previously unaffected countries or areas *(1)*.

Genomic analysis has identified three main CHIKV genotypes circulating globally: the West African genotype, the East, Central, and South African (ECSA) genotype, and the Asian genotype. Within the ECSA genotype, a genetically divergent Indian Ocean (IOL) sublineage emerged, characterized by the E1-A226V mutation. Currently, the ECSA and Asian genotypes are the most prevalent worldwide. The differences in the epidemic potential and pathogenicity of these lineages, as well as the possible cross-protective immunity between them, continue to be studied *(1)*.

During 2025, and as of mid-August, approximately 270,000 cases of chikungunya have been reported globally *(1-3)*, with cases reported in Africa, the Americas, Europe, the Western Pacific, and Southeast Asia *(4)*.

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In Africa, Senegal, Kenya, and Mauritius have reported cases during 2025 *(1, 4)*. In Europe, cases of local transmission have been confirmed in France (n= 111 cases) and Italy (n= 7 cases) *(4)*. In addition, significant outbreaks have been reported in French territories: on Reunion Island, the outbreak that began in August 2024 had accumulated more than 47,500 confirmed cases and more than 170,000 consultations for suspected chikungunya as of 4 May 2025; while Mayotte had reported 116 cases, including 29 imported cases, 57 cases of local transmission, and 30 under investigation *(5)*.

In the Southeast Asia Region, India reported an increase in cases during 2024, and Sri Lanka reported an increase in transmission between November 2024 and March 2025, with 151 confirmed cases in Colombo, Gampaha, and Kandy *(1, 6)*.

In the Western Pacific Region, China has reported a major outbreak in the city of Foshan, Guangdong province, since June 2025, with more than 7,000 confirmed cases *(3)*. In addition, Taiwan reported cases of chikungunya after more than six years without any cases *(3, 7)*.

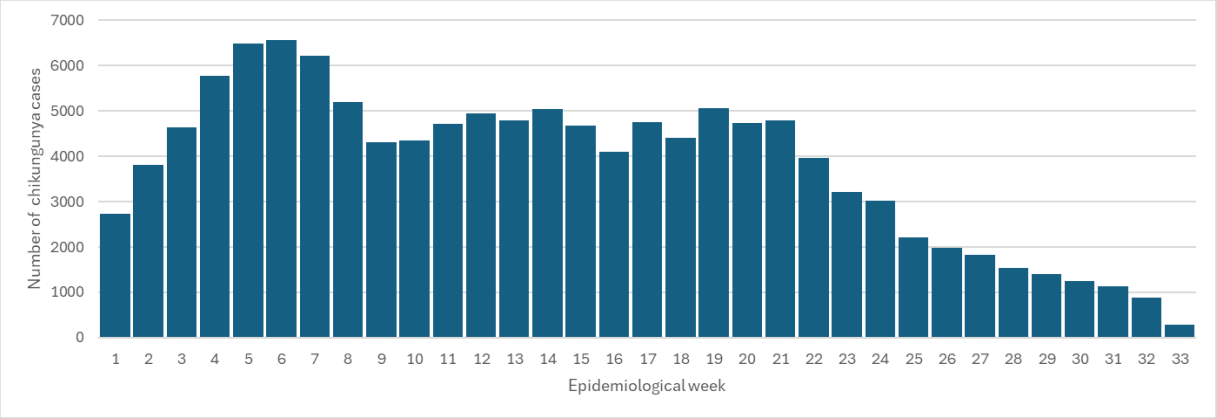
Summary of the situation of chikungunya and Oropouche in the Americas Region

Chikungunya situation in the Americas

In 2013, the chikungunya virus was introduced into the Americas Region and has since spread to most areas with competent vectors. According to genomic analysis, the Asian genotype was predominant in outbreaks reported in 2014 to 2020 in the Americas Region. However, in recent outbreaks in Brazil (Sao Paulo, 2020) *(8)*, Paraguay (Asunción and Central, 2022) *(9, 10)*, Bolivia (Santa Cruz, 2025) and parts of the Caribbean, the circulation of the ECSA genotype has been identified *(11)*. Although the Asian genotype continues to circulate at lower levels, its co-circulation with ECSA in the Region raises concerns about increased viral adaptation potential and the possibility of recombination or lineage change in the future.

Between epidemiological week (EW) 1 and EW 33 of 2025, a total of 212,029 suspected cases of chikungunya *(2)* were reported, with 124,942 (probable and confirmed) (**Figure1**) *(12-32)*, including 110 deaths, in 14 countries in the Americas Region *(12-32)*. In 2024, 431,417 suspected cases were reported, including 245 deaths from chikungunya, with 98% of cases reported in Brazil (n= 425,773 cases) *(2)*.

Figure 1. Distribution of probable and confirmed cases of chikungunya by epidemiological week of onset symptoms. Americas Region, 2025 (as of EW 33 of 2025).



*The information for Bolivia and Honduras corresponds to suspected cases.

Source: Adapted from data provided by the respective countries and reproduced by PAHO/WHO *(12-32)*.

The epidemiological situation of chikungunya in countries in the Americas Region is described below, organized in alphabetical order:

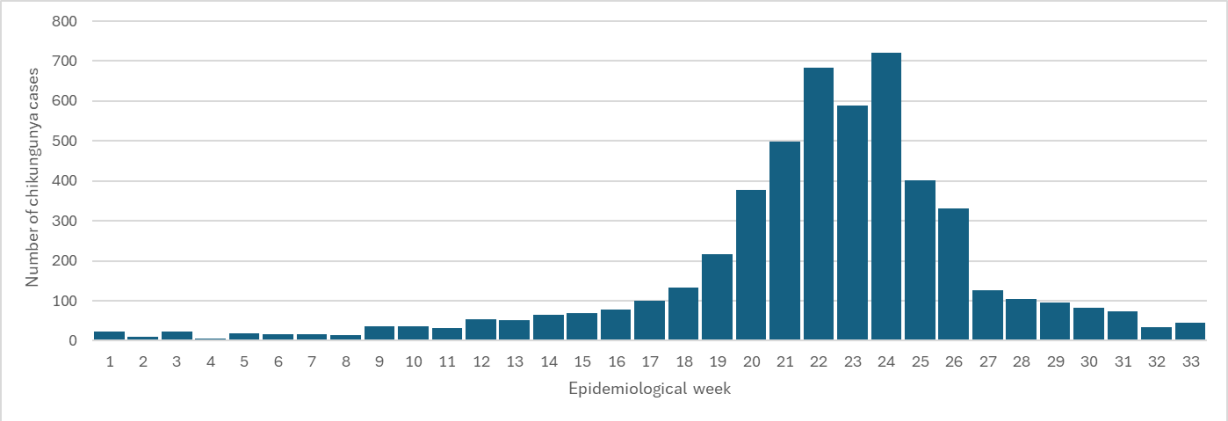
In **Argentina,** between EW 1 and EW 33 of 2025, 2,658 suspected cases were reported, of which 10 were confirmed by laboratory testing. Confirmed cases have been reported in the provinces of Entre Ríos (n= 6 cases), Buenos Aires (n= 2 cases), Córdoba (n= 1 case), and Tucumán (n= 1 case). Six of the ten confirmed cases correspond to women, and the highest proportion of cases was registered in the age group of 45 to 65 years (n = 4 cases). No deaths associated with CHIKV infection have been reported. The cumulative incidence at the national level through EW 33 was 0.02 cases per 100,000 population, representing a relative decrease of 98% compared with the same period in 2024 (0.93 cases per 100,000 population) *(12, 13)*.

In **Barbados**, between EW 1 and EW 33, a total of 79 cases of chikungunya were reported, of which six were laboratory-confirmed cases. The six cases correspond to autochthonous cases and five correspond to men. No deaths have been reported that may be associated with CHIKV. Until EW 33 of 2025, the national cumulative incidence is 2.1 cases per 100,000 inhabitants, which represents a relative decrease of 33% compared to the same period in 2024 (3.2 cases per 100,000 inhabitants) *(14)*.

In **Bolivia**, between EW 1 and EW 33 of 2025, a total of 5,162 cases of chikungunya were reported, of which 3,901 were laboratory confirmed, including four deaths (**Figure 2**). Most confirmed cases were concentrated in Santa Cruz (n= 3,872 cases, including 4 deaths), while lower numbers were reported in Beni (n= 12 cases), Pando (n= 5 cases), Cochabamba (n= 5 cases), Chuquisaca (n= 4 cases), and Tarija (n= 2 cases). In addition, one case was reported as imported from Brazil. Of the total, 55% (n= 2,150) were female, and the most affected age group was 30 to 39 years (15%, n= 594). Two neurological complications (Guillain-Barre syndrome) secondary to the chikungunya virus were also reported, as well as five cases of vertical transmission. In Bolivia, the circulation of the ECSA genotype without the presence of the E1-A226V mutation has been documented. The cumulative incidence at the national

level through EW 33 of 2025 was 10.5 cases per 10,000 population, a figure much higher than that reported in 2024 (0.0062 cases per 10,000 population) *(15, 16)*.

Figure 2. Distribution of chikungunya suspected cases by onset symptoms EW. Bolivia, 2025 (through EW 33 of 2025).



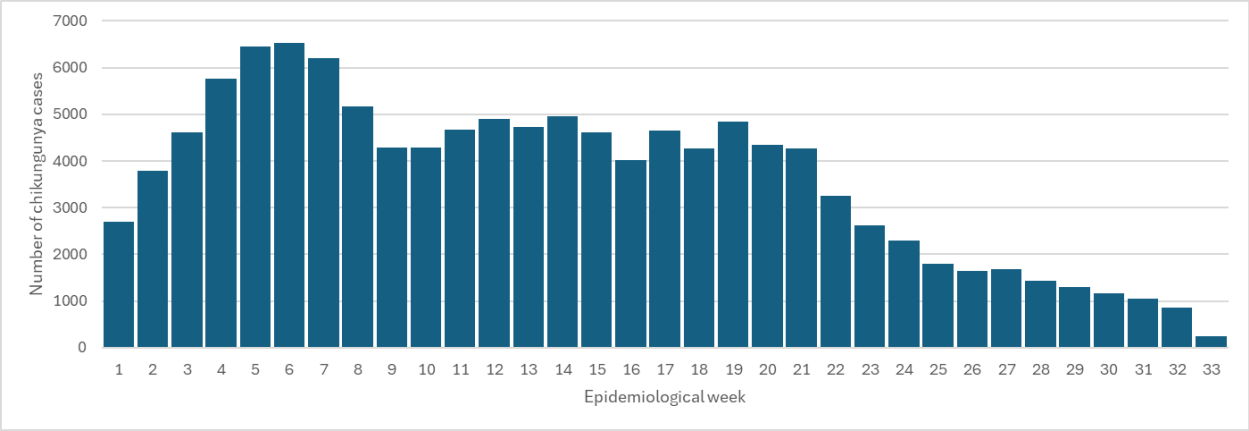
Source: Adapted from data provided by the Bolivian International Health Regulations National Focal Point (IHR NFP). Communication received on 20 August 2025, via email. La Paz; 2025. Unpublished *(16)*.

In **Brazil**, between epidemiological weeks (EW) 1 and EW 33 of 2025, 119,386 probable cases of chikungunya were reported, of which 55,180 were laboratory[1] confirmed, including 106 deaths (**Figure 3**). In total, 27 federal units reported cases; however, 77% of all cases (confirmed and probable) were concentrated in five states: Mato Grosso (48,389 probable cases, 23,848 laboratory-confirmed, including 57 deaths), Minas Gerais (15,950 probable cases, 2,282 laboratory-confirmed, including four deaths), Mato Grosso do Sul (13,521 probable cases, 6,838 laboratory-confirmed, including 15 deaths), São Paulo (8,609 probable cases, 5,727 laboratory-confirmed cases, including seven deaths) and Paraná (7,259 probable cases, 4,232 laboratory-confirmed cases, including six deaths)*(17, 18)*.

Of the total, 60% (n= 71,389) were female, and the highest proportion was in the 40-49 age group (17.1%, n= 20,431). In Brazil, the circulation of the ECSA genotype without the presence of the E1-A226V mutation has been documented *(19)*. The cumulative incidence at the national level through week 33 was 56.2 cases per 100,000 population, representing a 53% reduction compared with the same period in 2024 (118.1 cases per 100,000 population) *(17)*.

[1] 39% of cases in Brazil are clinically confirmed *(18)*.

Figure 3. Distribution of probable and confirmed cases of chikungunya by onset symptoms EW. Brazil, 2025 (as of EW 33 of 2025).



Source: Adapted from data provided by the Brazil International Health Regulations National Focal Point (IHR NFP) Communication received on 20 August 2025, by email. Brasilia; 2025. Unpublished *(17)*.

In **Chile,** between EW 1 and EW 32 of 2025, three imported cases of chikungunya were reported, originating from Bolivia, Indonesia, and Brazil. All were confirmed by laboratory testing. Two of the cases corresponded to men aged 29, 52 and 61 years. No deaths have been reported *(20)*.

In **Colombia**, between EW 1 and EW 32 of 2025, 44 cases of chikungunya were reported, of which 35 were clinically confirmed and no laboratory-confirmed cases are recorded. Confirmed cases have been reported in the departments of Tolima (n= 7 cases), Antioquia (n= 4 cases), Cundinamarca (n= 3 cases), Putumayo (n= 3 cases), Meta (n= 3 cases), Cauca (n= 2 cases), Sucre (n= 2 cases), Guaviare, Caldas, Santa Marta, Santander, Bolívar, Guainía, Vichada, Boyacá, Cartagena, Cali, and Huila (n= 1 case each)*(21)*.

Of the total, 63% (n= 22) were female, and the age group with the highest proportion of cases was 10 to 19 years (25.71%, n= 9). No deaths have been reported. The cumulative incidence at the national level through EW 32 was 0.11 cases per 100,000 population, representing a relative increase of 10% compared to the same period in 2024 (0.10 cases per 100,000 population) *(21)*.

In **Costa Rica,** between EW 1 and EW 33 of 2025, nine probable cases of chikungunya were reported, none of which were confirmed by polymerase chain reaction (PCR) testing. Five of the nine cases corresponded to women and the most affected age group corresponds to those over 15 years of age. The cumulative incidence at the national level as of EW 33 was 0.2 cases per 100,000 population *(22)*.

In **Cuba**, between EW 1 and EW 33 of 2025, eight cases of chikungunya were reported, all confirmed by laboratory testing, in the province of Matanzas. Four of the cases corresponded to women and six of the eight cases were registered in people between 19 and 54 years of age. The circulation of the ECSA genotype has been documented in Cuba. The cumulative incidence at the national level as of EW 33 was 0.08 cases per 100,000 population *(23)*.

In **El Salvador,** between EW 1 and EW 33 of 2025, 13 suspected cases of chikungunya were reported, all with negative PCR results. Sixty-nine percent (n= 9) were female, and the highest proportion was in the 30-39 age group (38%, n= 5). No deaths have been reported. The cumulative incidence at the national level as of EW 33 was 0.2 cases per 100,000 population, representing a 66% decrease compared with the same period in 2024 (0.6 cases per 100,000 population) *(24)*.

In **Guatemala,** between EW 1 and EW 31 of 2025, no confirmed cases of chikungunya were reported, although 21 suspected cases were reported. It is important to note that, in addition to the samples processed for suspected cases, cross-laboratory surveillance for other arboviruses is ongoing. In this context, the National Health Laboratory reported processing a total of 2,228 samples for CHKV during the same period *(25)*.

The last cases confirmed by IgM were reported in 2023 and 2024. In 2023, one case was reported in a 28-year-old female resident of the department of Chiquimula. In 2024, three cases were confirmed (incidence rate of 0.016 per 100,000 population), two male patients aged 30 and 45 and one female patient aged 9, residents of the departments of San Marcos, Suchitepéquez, and Sacatepéquez, respectively *(25)*.

In **Honduras**, between EW 1 and EW 32 of 2025, seven cases of chikungunya were reported, none confirmed by the polymerase chain reaction (PCR) test. These suspected cases were reported in the departments of Cortés (n= 5 cases), El Paraíso (n= 1 case), and Santa Bárbara (n= 1 case). Five of the cases corresponded to women. No deaths have been reported. The cumulative incidence at the national level as of EW 32 was 0.07 cases per 100,000 population *(26)*.

In **Paraguay**, between EW 1 and EW 33 of 2025, 49 cases of chikungunya were reported, of which 47 were confirmed by laboratory tests. Confirmed cases were reported in the departments of Amambay (n= 22 cases), Itapúa (n= 12 cases), Guairá (n= 8 cases), Misiones (n= 4 cases), and Capital (n= 1 case) *(27)*.

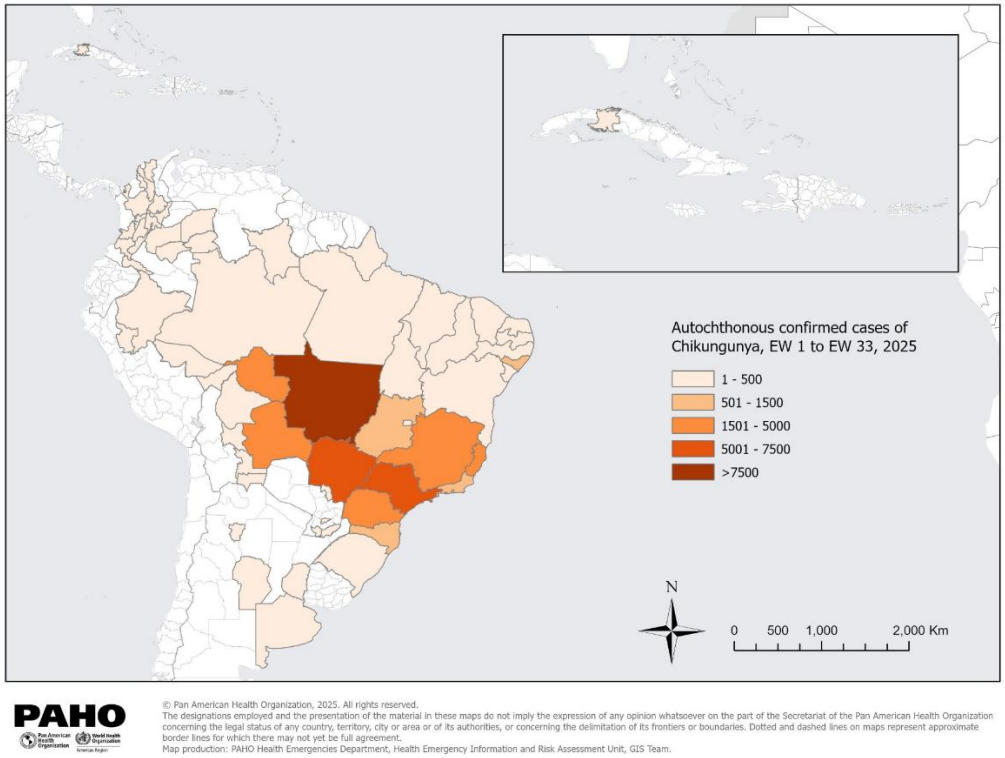
Of the total, 61% (n= 30) were female, and the highest proportion of cases was reported in the 20-39 age group (29%, n= 14). No deaths were reported. In Paraguay, the circulation of the ECSA genotype has been documented, without the presence of the E1-A226V mutation, from 2022 to date *(28)*. The national cumulative incidence as of EW 33 is 0.8 cases per 100,000 population, representing a 33% increase compared with the same period in 2024 (0.6 cases per 100,000 population) *(27)*.

In **Peru,** between EW 1 and EW 32 of 2025, 84 cases were reported, of which 16 were laboratory confirmed and 68 classified as probable. Confirmed cases have been reported in the departments of San Martin (n= 14 cases) and Loreto (n= 2 cases). Sixty-one percent (n= 51) were female, and the highest proportion was observed in the 0-11 age group (29.7%, n= 25). No deaths have been reported. The cumulative incidence at the national level as of EW 32 of 2025 was 0.25 cases per 100,000 population, representing an increase of 127.2% compared with the same period in 2024 (0.11 cases per 100,000 population) *(29, 30)*.

In the **United States of America**, as of 19 August 2025, 54 imported cases of chikungunya were reported in 21 states (California, Colorado, Connecticut, Florida, Illinois, Kansas, Kentucky,

Louisiana, Massachusetts, Maryland, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Virginia, and Washington). No cases of local transmission or deaths were reported *(31, 32)*.

Figure 4. Geographic distribution of chikungunya confirmed autochthonous cases in the Americas Region, 2025 (as of EW 33 of 2025).

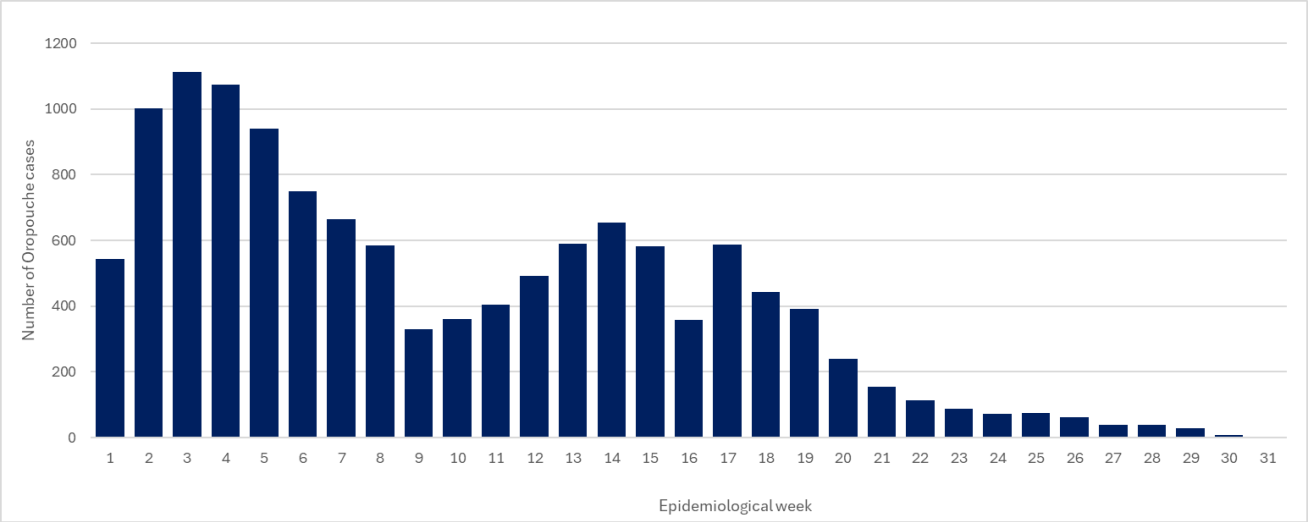


Source: Adapted from data provided by the respective countries and reproduced by PAHO/WHO *(12-32)*.

Situation in Oropouche in the Americas Region

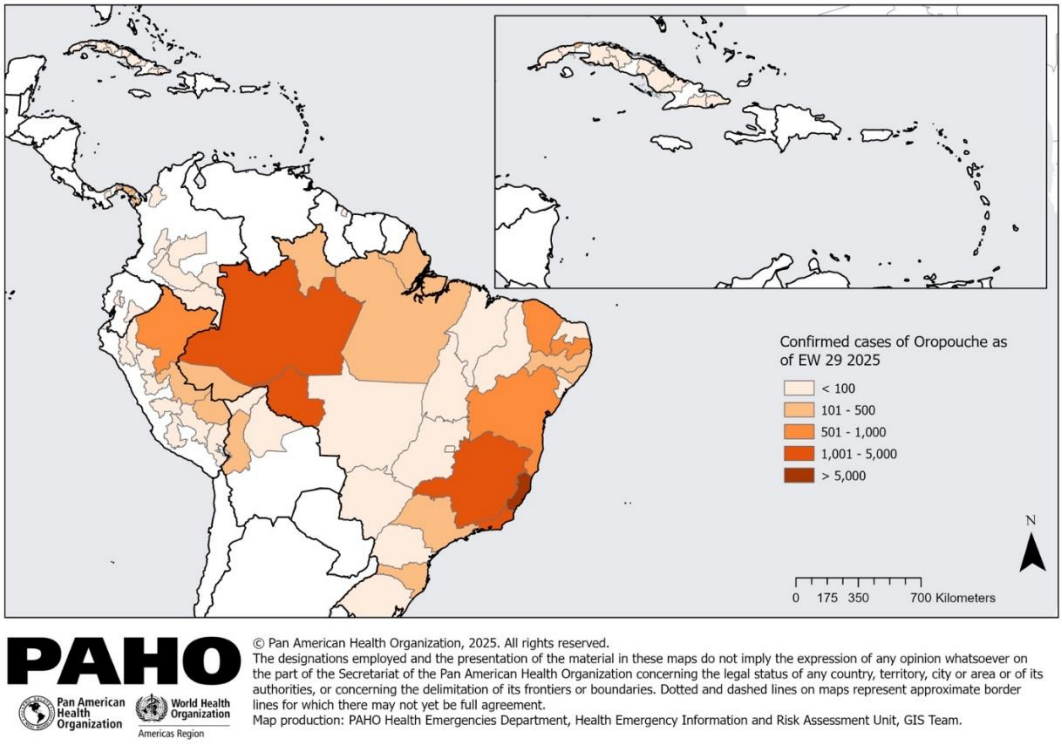
In 2025, between EW 1 and EW 30, 12,786 confirmed cases of Oropouche were reported in the Americas Region. Confirmed cases were reported in 11 countries: Brazil (n= 11,888 cases including five deaths), Canada (n= 1 imported case), Chile (n= 2 imported cases), Colombia (n= 26 cases), Cuba (n= 28 cases), the United States of America (n= 1 imported case), Guyana (n= 1 case), Panama (n= 501 cases including one death), Peru (n= 330 cases), Uruguay (n= 3 imported cases), and Venezuela (Bolivarian Republic of) (n= 5 cases) (**Figure 5**) *(33)*.

Figure 5. Distribution of confirmed autochthonous cases of Oropouche by epidemiological week of onset symptoms. Americas Region, 2025 (As of EW 30 of 2025).



Source: Adapted from Pan American Health Organization/World Health Organization. Oropouche Epidemiological Update in the Americas Region, 13 August 2025. Washington, D.C.: PAHO/WHO; 2025 *(33)*.

Figure 6. Geographic distribution of cumulative confirmed cases of autochthonous Oropouche transmission in the Americas Region, 2025*.



Source: Adapted from Pan American Health Organization/World Health Organization. Oropouche Epidemiological Update in the Americas Region, 13 August 2025. Washington, D.C.: PAHO/WHO; 2025 *(33)*.

Guidance for national authorities

Given the increase in the number of chikungunya cases in some countries, both within and outside the Region, and the risk of the Oropouche virus spreading to new areas with susceptible populations, PAHO/WHO urges Member States to take the necessary measures to address possible outbreaks of these diseases.

In this regard, the strengthening of surveillance, diagnosis, and timely and appropriate treatment of cases of chikungunya, Oropouche, and other arboviruses is encouraged. At the same time, it is recommended to intensify vector prevention and control actions, as well as to prepare health care services to ensure patient access to adequate care.

PAHO/WHO reminds Member States that the same guidance published in the Epidemiological Alert of 13 February 2023, on the increase in chikungunya in the Americas Region, available from: https://www.paho.org/en/documents/epidemiological-alert-chikungunya-increase-region-americas *(34)*, as well as the guidance related to Oropouche published in the Epidemiological Update of 13 August 2025, available from: https://www.paho.org/en/documents/epidemiological-update-oropouche-region-americas-13-august-2025 *(33)*.

Adaptation of health care services

Given the risk of increased incidence of chikungunya and Oropouche in some areas of the Region, PAHO/WHO advises Member States to adapt their health services to ensure a timely response at all levels of care in the event of outbreaks *(33, 34)*. This includes:

- Organizing clinical triage, patient flow, follow-up, and hospitalization of patients in each institution and level of care.
- Adapting health services and the care network to respond to outbreaks or epidemics.
- Strengthening patient care networks for the diagnosis, management, and follow-up of patients with suspected chikungunya (including the chronic phase), Oropouche, or dengue.

Integrated Surveillance

PAHO/WHO encourages maintaining and strengthening epidemiological surveillance at the national level and sharing reports of cases of chikungunya, Oropouche, dengue, and Zika with the Organization to facilitate regional characterization and analysis.. Although testing for OROV in cases suspected of dengue (or other arboviruses) that have tested negative using molecular methods (in a percentage or number of negative samples depending on the capacity of each laboratory) is a useful strategy for detecting OROV, it is necessary to strengthen specific OROV surveillance through training of healthcare personnel in the clinical suspicion of this disease, as well as in its differential clinical diagnosis. The case definition for Oropouche can be found on the PAHO website *(35)*.

Given that cases of these diseases (chikungunya, Oropouche, and dengue) can occur in the same territory but are transmitted by vectors with different habits and characteristics, it is important to intensify efforts to analyze their spatial distribution. This will enable a faster and more targeted response in the most affected areas. Information on critical transmission points for dengue, Zika, chikungunya, and Oropouche should be used to guide intensive vector control actions *(33, 34)*.

Entomological surveillance, in addition to identifying the main vector species involved in transmission, such as *Aedes aegypti* and *Aedes albopictus* for chikungunya, dengue, and Zika *(34)*, as well as the main vector *Culicoides paraensis* for Oropouche *(33)*, must measure their density in risk areas and evaluate the impact of the control measures implemented. As these are vectors with different ecosystems (*Aedes aegypti* versus *Culicoides*), transmission dynamics regularly occur in different areas.

Laboratory confirmation

Chikungunya

The initial diagnosis of chikungunya virus (CHIKV) infection is clinical, and adequate suspicion can guide the confirmation protocol. However, laboratory results should always be analyzed in conjunction with epidemiological information and context for surveillance purposes and not as a basis for clinical decision-making *(36)*.

Clinical suspicion of CHIKV infection can be confirmed in the laboratory using virological techniques, mainly molecular detection by PCR. The ideal sample for detection is serum collected during the acute phase of infection, preferably within the first 5 days after symptom onset. However, because CHIKV often presents with prolonged viremia, a sample taken up to day 8 after symptom onset may be useful for molecular confirmation *(36)*.

There are different algorithms for the molecular detection of CHIKV, depending on the epidemiological and clinical context. Thus, in the event of clinical suspicion compatible with CHIKV infection, it is recommended to start with a specific PCR test, where a positive result confirms the infection. if the result is negative, sequential detection of other arboviruses, mainly dengue virus (DENV) and Zika virus (ZIKV), or other pathogens considered within the differential diagnosis, can be continued (**Figure 7**) *(36)*.

However, when clinical suspicion is unclear and symptoms are nonspecific and may be compatible with other arboviruses (or even other pathogens), or in the context of syndromic surveillance, a *multiplex* amplification protocol that allows the simultaneous detection of at least three of the most likely endemic arboviruses (DENV, CHIKV, and ZIKV) may be more efficient (**Figure 8**) *(36)*.

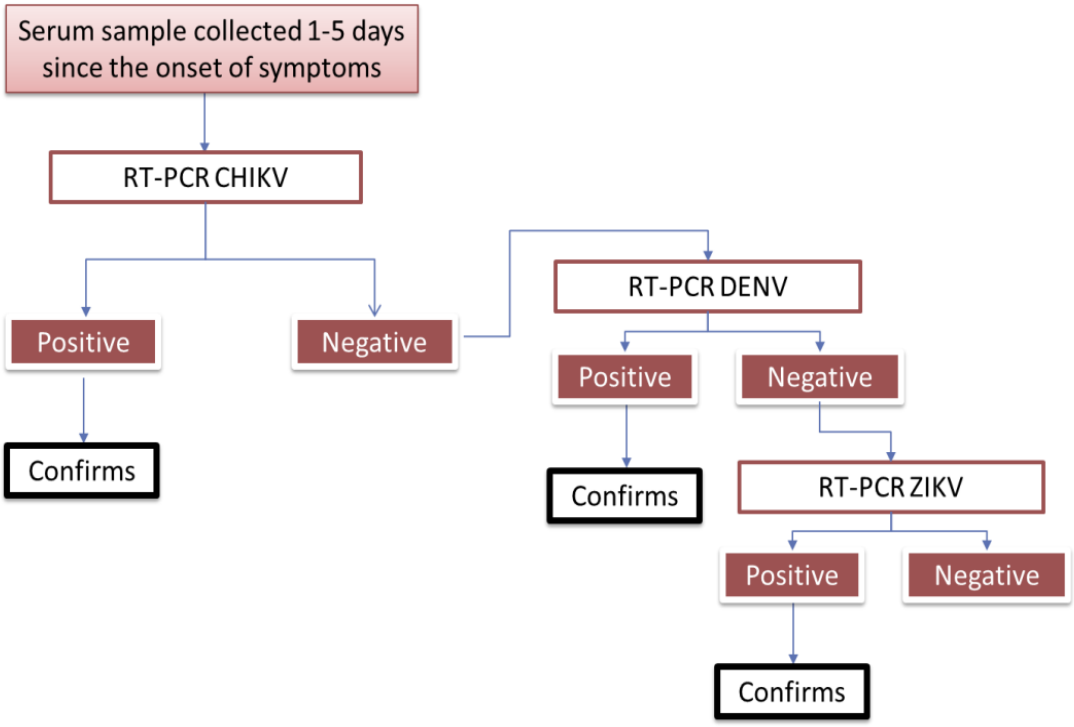
In fatal cases, tissue samples, mainly from the liver and spleen, should be taken for molecular detection. These samples are also useful for histopathological analysis to support the diagnosis and better characterize the case *(36)*.

Serological confirmation of CHIKV infection is only possible when paired samples collected at least one week apart (acute phase and convalescent phase) are processed. Seroconversion (IgM negative in the initial sample and positive in the second sample, by ELISA or neutralization) or at least a fourfold increase in antibody titer (using a quantitative method) can confirm the diagnosis. However, it is important to note that serological tests are susceptible to cross-reactions, especially with other alphaviruses including Mayaro. Furthermore, a positive result in a single sample is not considered confirmatory, since, in addition to the possibility of cross-reaction, IgM may remain detectable for several months or even years after infection, and therefore detection may reflect past infection *(36)*.

In cases with neurological manifestations (e.g., meningoencephalitis), molecular and serological detection can be performed on cerebrospinal fluid (CSF) samples. However, this sample should only be taken on clinical indication and not for the specific purpose of identifying the etiological agent. Although a positive molecular test result in CSF confirms infection, a negative result does not rule it out *(36)*.

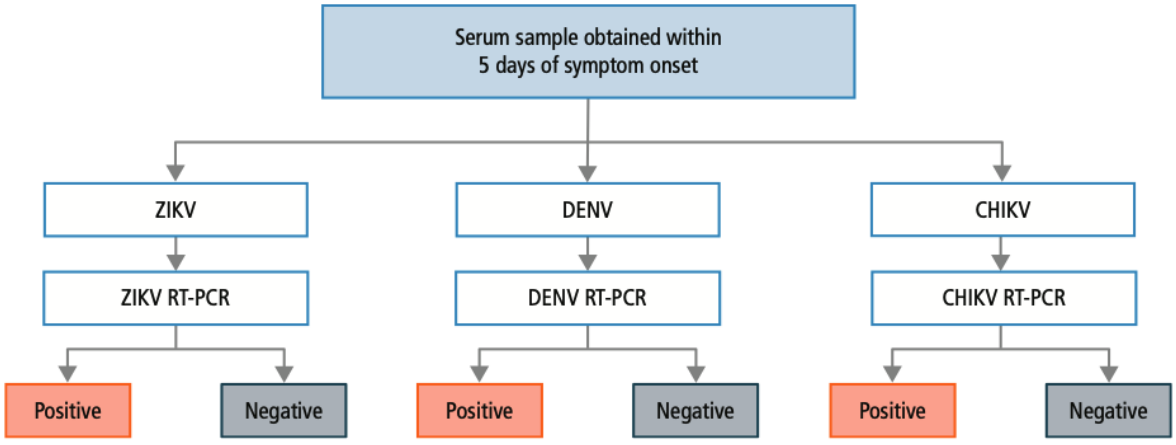
Finally, given the initial clinical similarity between chikungunya and measles, and considering the risk that the latter poses to the Region, it is recommended that measles be included as a differential diagnosis *(37)*.

Figure 7. Sequential algorithm for virological testing in suspected cases of chikungunya



Source: Pan American Health Organization. Recommendations for the detection and laboratory diagnosis of arbovirus infections in the Americas. Washington, D.C.: PAHO; 2022. Available from: https://iris.paho.org/handle/10665.2/57555 *(36)*.

Figure 8. Multiplex algorithm for virological testing in suspected cases of chikungunya



Source: Pan American Health Organization. Recommendations for the detection and laboratory diagnosis of arbovirus infections in the Americas Region. Washington, D.C.: PAHO; 2022. Available from: https://iris.paho.org/handle/10665.2/56321 *(36)*

Genomic characterization and surveillance

Understanding CHIKV genotypes [Asia, East/Central/South Africa (ECSA) and Indian Ocean (IOL)] is essential to anticipate transmission dynamics, guide public health interventions, and monitor viral evolution *(19)*. These genotypes differ in their geographic spread, epidemic potential, and adaptation to mosquito vectors such as *Aedes aegypti* and *Ae. albopictus.*

Genomic surveillance plays a critical role in identifying circulating strains by detecting key mutations such as A226V. This amino acid substitution in the E1 envelope glycoprotein (alanine to valine at position 226) is recognized for enhancing viral replication in *Aedes albopictus,* a mosquito species widely distributed in temperate and subtropical regions *(38)*. The A226V mutation was crucial in previous explosive outbreaks driven by the Indian Ocean genotype (IOL), a sublineage of the East, Central, and South African genotype (ECSA), particularly in Réunion (2005–2006), India (2006–2007), and Thailand (2019).

The IOL genotype continues to circulate in South and Southeast Asia and the Middle East, often associated with the A226V mutation, and has displaced the Asian genotype in some settings due to its greater epidemic potential. The ECSA genotype, considered ancestral to both the IOL and Asian genotypes, remains endemic in many parts of sub-Saharan Africa and has also been identified in the Americas, particularly since 2014. Notably, ECSA strains have caused indigenous transmission in Brazil, Paraguay, Bolivia, and parts of the Caribbean *(19, 30)*. These introductions were independent of the Asian genotype that initially drove the 2014–2015 outbreaks in the Americas. Although some ECSA strains in the region have acquired mutations of epidemiological importance, the A226V mutation has not been documented in any strains detected in the Americas. The co-circulation of ECSA and Asian genotypes in the Americas has raised concerns about increased viral adaptability and possible recombination or genotype changes in the future.

The Asian genotype, initially responsible for large-scale epidemics in the Americas between 2014 and 2020, continues to circulate at lower levels but is generally less adapted to *Ae. albopictus* and lacks the A226V mutation.

Oropouche

Guidance on the diagnosis and laboratory surveillance of emerging arboviruses, including OROV, are detailed in the **"Guidelines for the Detection and Surveillance of Emerging Arboviruses in the Context of Other Arbovirus Circulation"** and **"Guidelines for the Detection and Surveillance of Oropouche in Possible Cases of Vertical Infection, Congenital Malformation, or Fetal Death"** *(39, 40)*.

Case management

Chikungunya

CHIKV disease can cause a wide range of clinical manifestations, although it is mainly characterized by the onset of fever associated with arthritis or arthralgia. Other common manifestations include headache, muscle pain, rash, and pruritus.

The duration of symptoms varies from a few days to several months, thus determining the different phases of the disease: acute, post-acute, and chronic, each with specific care requirements. The acute phase lasts up to 2 weeks, the post-acute phase lasts from the third week to the third month, and the chronic phase begins after the fourth month and can last for years *(41)*. In most patients in the chronic phase, a significant deterioration in quality of life is observed during the first few years after chikungunya infection.

Consequently, it is recommended that training for health personnel at all levels and for all phases of the disease be strengthened.

- Train health professionals in the diagnosis and management of suspected cases of chikungunya, as well as other arboviruses prevalent in the Region, particularly dengue and Zika.
- Strengthen competencies at different levels of care for the prevention and treatment of sequelae of the chronic phase of chikungunya.
- Adapt the "Guidelines for the clinical diagnosis and treatment of dengue, chikungunya, and Zika" *(41)* to the national and subnational levels.
- Offer ongoing training workshops for public and private health personnel on the organization of health services, including outbreak response.

Likewise, pregnant women, children under 1 year of age, older adults, and people with comorbidities (hypertension, chronic renal failure, diabetes, obesity, heart disease, among others) should be advised to go immediately to the nearest health facility at the first sign of suspected chikungunya infection, given the increased risk of severe symptoms or complications from this disease. In addition, all newborns of mothers with suspected or confirmed chikungunya in the 15 days prior to delivery should be hospitalized.

It is important to note that chikungunya disease can be fatal during the acute phase, mainly in this group of patients (pregnant women, children under 1 year of age, older adults, and people with comorbidities). Severe manifestations include shock, meningoencephalitis, and Guillain-Barré syndrome *(9, 42, 43)*.

Oropouche

The disease is characterized by sudden fever, severe headache, extreme weakness (prostration), joint and muscle pain, chills, nausea, diarrhea, and persistent vomiting. Although most patients recover within a week, some experience prolonged convalescence. Serious complications, such as aseptic meningitis, are rare but may occur in the second week of the illness *(44)*.

The management of Oropouche virus infection is symptomatic, focusing on relieving pain and fever, hydrating or rehydrating the patient, and controlling vomiting. In cases of disease with neuroinvasive or dysautonomia manifestations, admission of the patient to specialized units that allow continuous monitoring is recommended. Currently, there are no vaccines or specific antivirals available to prevent or treat OROV infection.

During the first week of the disease, the main differential diagnosis to consider is dengue. In the second week, meningitis and encephalitis should be included as differential diagnoses. It has been reported that up to 60% of patients experience a recurrence of symptoms in the weeks following recovery *(45)*.

Community involvement

Every effort should be made to obtain community support for the prevention of dengue, chikungunya, Oropouche, and Zika.

Simple information, education, and communication (IEC) materials can be disseminated through various media, including social media.

Household members should be encouraged to eliminate mosquito breeding sites, both indoors and outdoors.

Highly productive mosquito breeding sites, such as water storage containers (drums, elevated tanks, clay pots, etc.), should be targeted for vector breeding prevention measures. Other breeding sites, such as roof gutters and other water-holding containers, should also be cleaned regularly.

Local teams often know how to make this information more effective, and in many cases national campaigns and messages are not as effective as local initiatives.

Entomological surveillance, prevention, and vector control

PAHO/WHO urges Member States to make effective use of available resources to prevent and/or control vector infestation in affected areas and in health services *(46)*. This will be achieved through the implementation of integrated vector control strategies in emergencies, which include the following processes:

- Selection of control methods based on knowledge of vector biology, disease transmission, morbidity, and PAHO/WHO recommendations.
- Use of multiple interventions, often in combination and synergistically, with adequate coverage.
- Collaboration between the health sector and public and private sectors involved in environmental management whose work has an impact on vector reduction.
- Integration of individuals, families, and other key partners (education, finance, tourism, water and sanitation, and others) into prevention and control activities.

- Strengthening of the legal framework to enable an integrated and intersectoral approach.

Aedes prevention and control measures

Given the high infestation by *Aedes aegypti* and the presence of *Aedes albopictus* in the Region, it is recommended that prevention and control measures be aimed at reducing vector density and have the acceptance and collaboration of the local population. Prevention and control measures to be implemented by national authorities should include the following:

- Strengthen environmental management actions, mainly the elimination of vector breeding sites in homes and common areas (parks, schools, health facilities, cemeteries, etc.).
- Reorganize solid waste collection services to support breeding site elimination actions in areas with the highest transmission rates and, if necessary, plan intensive actions in specific areas where regular garbage collection has been interrupted.
- Apply measures to control breeding sites through the use of physical, biological, and/or chemical methods that actively involve individuals, families, and the community *(47)*.
- Define high-risk areas for transmission (risk stratification) *(37)* and prioritize those where there are concentrations of people (schools, terminals, hospitals, health centers, etc.). In these facilities, the mosquito must be eliminated within a radius of at least 400 meters. Special attention should be paid to health facilities, which should be free of the vector and its breeding sites so that they do not become sources of virus transmission.
- In areas where active transmission is detected, it is recommended to implement measures aimed at eliminating infected adult mosquitoes (mainly through the use of insecticides) in order to stop and interrupt transmission. This action is exceptional and is only effective when carried out by properly trained personnel under internationally accepted technical guidelines and when done in conjunction with the other proposed actions. The main action to interrupt transmission of Chikungunya, when it occurs intensively, is the elimination of infected adult mosquitoes (active transmission) through indoor fumigation, using individual equipment, combined with the destruction and/or control of vector breeding sites inside homes.
- An effective method of adult control that can be used, considering the operational capabilities available, is residual spraying indoors, which should be applied selectively to the resting places of *Aedes aegypti,* taking care not to contaminate containers used for storing drinking water or for cooking. This intervention in treated areas is effective for up to four months and can be used in shelters, homes, health services, schools, and other locations. For more information, consult the Manual for applying indoor residual spraying in urban areas for the control of *Aedes aegypti (48)* and the document Control of *Aedes aegypti* in the context of simultaneous transmission of COVID-19 *(49)*.
- Choose the appropriate insecticide to be used (following PAHO/WHO recommendations), its formulation, and be aware of the susceptibility of mosquito populations to that insecticide *(50)*.

- Ensure the proper functioning and calibration of fumigation equipment and its maintenance, and ensure insecticide reserves.
- Intensify supervision (quality control) of field work by operators, both during focal treatment and adulticide treatment (fumigation), ensuring compliance with personal protection measures.

Culicoides prevention and control measures

OROV is transmitted to humans through the bite of the *Culicoides paraensis* midge, considered the main vector of this disease and widely distributed in the Americas. Other vectors such as the *Culex quinquefasciatus* mosquito can transmit OROV, but are considered of secondary importance *(51)*.

The proximity of vector breeding sites to human dwellings is a significant risk factor for OROV infection. Vector control strategies focus on reducing vector populations by identifying and eliminating their breeding and resting sites. Measures implemented include *(52-54)*:

- Strengthen entomological surveillance in areas at risk of OROV transmission to detect species with vector capacity. Guidelines for identifying the main *Culicoides* species are detailed in the operational document available from: https://iris.paho.org/handle/10665.2/67598 *(55)*.
- Mapping urban, peri-urban, and rural areas with conditions conducive to the development of potential vectors.
- Promote good agricultural practices to prevent the accumulation of waste that could serve as breeding and resting sites for vectors.
- Fill or drain water collections, ponds, or temporarily flooded areas that may serve as oviposition sites for females and breeding sites for vector larvae.
- Eliminating weeds around properties to reduce resting and shelter sites for vectors.

In addition, taking into account the ecological characteristics of the main vectors of OROV, it is important to consider that the decision to carry out vector control activities with insecticides depends on entomological surveillance data and variables that may condition an increase in the risk of transmission. In transmission areas, insecticide spraying may be an additional measure, especially in urban and peri-urban areas, when technically recommended and feasible *(52, 53)*.
Additional information on vector control measures can be found in the document "**Provisional guidelines for entomological surveillance and prevention measures for Oropouche virus vectors"** *(56)*.

Personal protection measures

Patients infected with chikungunya, dengue, Oropouche, or Zika virus are the reservoir of infection for other people both in their homes and in the community. It is necessary to inform patients, their families, and the affected community about the risk of transmission and ways to prevent infection by reducing the vector population and contact between the vector and

people. It is important to reinforce these measures in the case of pregnant female, given the risk of vertical transmission of Oropouche and Zika *(52, 53)*.

To minimize vector-patient contact, the following is recommended:

- Protect homes with fine mesh screens on doors and windows[2].
- Wear clothing that covers the legs and arms, especially in homes where someone is sick with Oropouche or another arbovirus.
- Use repellents containing DEET, IR3535, or icaridin, which can be applied to exposed skin or clothing, and use them strictly according to the product label instructions.
- Use of mosquito nets, impregnated or not with insecticides, for those who sleep during the day (e.g., pregnant female, infants, sick or bedridden persons, the elderly).
- In outbreak situations, outdoor activities should be avoided during the period of peak vector activity (at dawn and dusk).
- For people at higher risk of being bitten, such as forestry and agricultural workers, etc., it is recommended to wear clothing that covers exposed parts of the body and to use the repellents mentioned above.

[2] It is recommended that the mesh holes be less than 1.0 mm in size, as the average size of the female *Culicoides paraensis*, considered the main vector involved in OROV transmission, is 1 to 1.5 mm.

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