

In recent months, there has been an increase in the detection of cases of Oropouche fever in certain areas of the Region of the Americas. In addition, there is a heightened prevalence of dengue circulation reported in several countries in the region. In response to this, the Pan American Health Organization / World Health Organization (PAHO/WHO) shares with Member States recommendations for the differential diagnosis of the Oropouche virus and recommends strengthening vector control and personal protection measures for the population most at risk.

### Background in the Region of the Americas

In the Americas, numerous outbreaks of Oropouche virus disease (OROV) have been reported in rural and urban communities in Brazil, Ecuador, French Guiana, Panama, Peru, and Trinidad and Tobago (1). In most of these outbreaks, people of both sexes and of all ages were affected. In populations with previous contact with the virus, children and young people were most affected (1).

The circulation of the Oropouche virus is suspected to include both epidemic and jungle cycles. In the jungle cycle, primates, sloths, and perhaps birds are vertebrate hosts, although no definitive arthropod vector has been identified. In the urban epidemic cycle, humans are the amplifying host and OROV is transmitted mainly through the bite of the *Culicoides paraensis* mosquito that is present in the region, as well as *Culex quinquefasciatus*, which can also be a vector (1,2,3).

Outbreaks of Oropouche virus in the last ten years have taken place mainly in the Amazon region.

#### What is Oropouche Fever?

Oropouche fever (ICD-10 A93.0) is a zoonosis caused by Oropouche virus, a segmented single-stranded RNA virus that is part of the family *Peribunyaviridae*.

It is transmitted to humans primarily through the bite of the *Culicoides paraensis* mosquito.

The disease produces symptoms similar to dengue. It has an incubation period of 4 to 8 days (range between 3 and 12 days). The onset is sudden, usually with fever, headache, arthralgia, myalgia, chills, and sometimes persistent nausea and vomiting for up to 5 to 7 days. Occasionally, aseptic meningitis may occur.

Most cases recover within 7 days, however, in some patients, convalescence can take weeks (2,3).

### Current situation

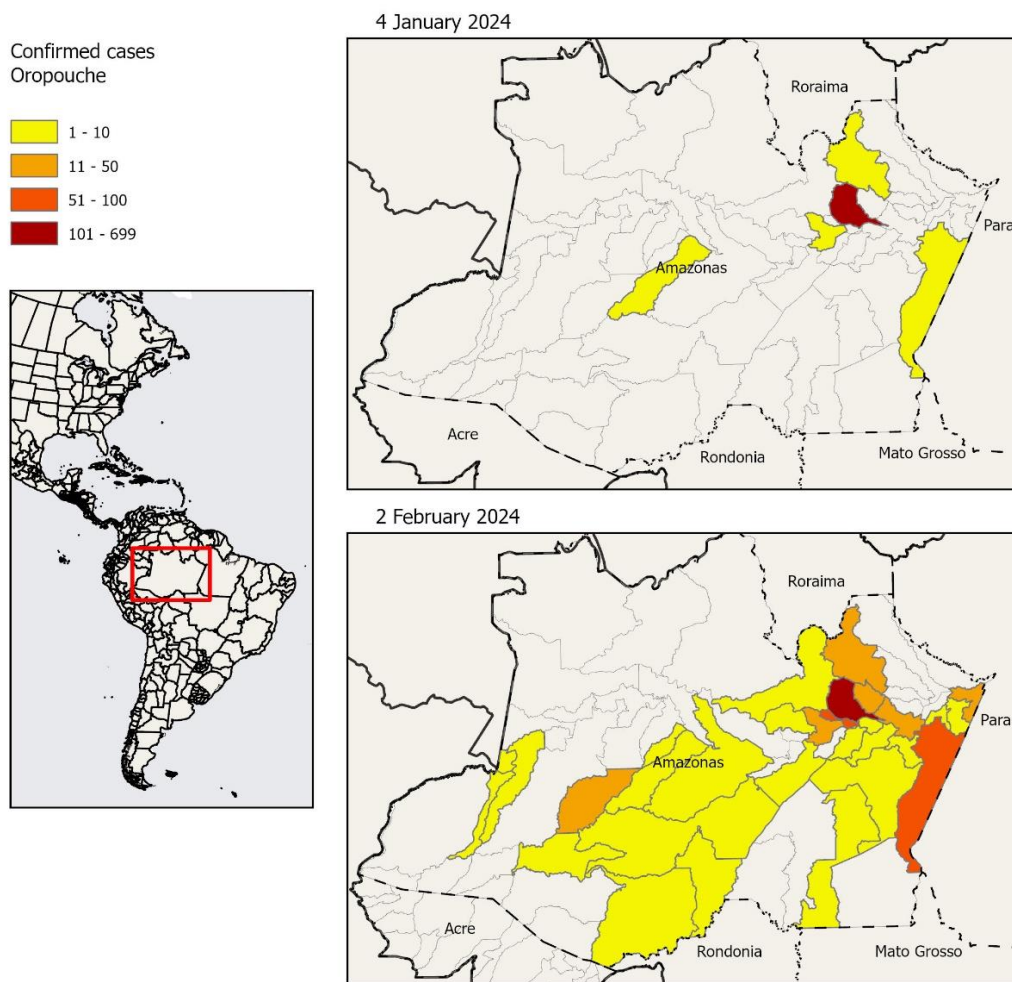
In **Brazil**, on 6 January 2024, the Health Surveillance Foundation (FVS as per its acronym in Portuguese) of the state of Amazonas published an epidemiological alert regarding the detection of cases of Oropouche virus (OROV) disease in this state. The alert reported that between December 2023 and 4 January 2024, the Central Public Health Laboratory of Amazonas (Lacen-AM as per its acronym in Portuguese) analyzed 675 samples, confirming OROV virus infection by molecular detection (PCR) in 199 (29.5%). Of this total, 94.9% (189) correspond to the municipality of Manaus, 2.5% (5) to the municipality of Presidente Figueiredo, 1% (2) to Maués, 1% (2) to Tefé and 0.5% (1) to Manacapuru (4).

**Suggested citation:** Pan American Health Organization / World Health Organization. Epidemiological Alert: Oropouche in the Region of the Americas, 2 February 2024. Washington, D.C.: OPS/OMS; 2024.

Between 2023 and 2024, in the state of Amazonas, 1,066 human cases with detectable results in the RT-qPCR for Oropouche virus were registered. Of these, 699 samples were from Manaus, 88 from Maués, 69 from Iranduba, 36 from Manacapuru, 32 from Presidente Figueredo, 29 from Parintins, 22 from Carauari, 21 from Itacoatiara, 17 from Rio Preto da Eva, 09 from Careiro, 08 of Borba and Coari, 06 of Novo Airão and Tefé. There is record of transmission in the municipalities of Alvares, Autazes, Barreirinha, Benjamin Constant, Beruri, Boa Vista do Ramos, Caapiranga, Canutama, Cordeiro da Várzea, Itamarati, Lábrea, Nova Olinda do Norte, Novo Aripuanã, São Paulo de Olivença, Tabatinga, and Tapauá (5).

In addition, cases of OROV reported in the states of Acre and Roraima are under investigation.

**Map.** Distribution of Oropouche cases in the State of Amazonas, Brazil, 2024



© Pan American Health Organization, 2024. All rights reserved.  
 The designations employed and the presentation of the material in these maps do not imply the expression of any opinion whatsoever on the part of the Secretariat of the Pan American Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.  
 Map production: PAHO Health Emergencies Department, Health Emergency Information and Risk Assessment Unit, GIS Team.

**Source:** Report sent by the Brazil International Health Regulations (IHR) National Focal Point (NFP), and Report from the Health Surveillance Foundation (FVS as per its acronym in Portuguese) of the state of Amazonas.

In **Colombia**, through a study published on 8 December 2022, conducted by the National University of Colombia, 87 cases of Oropouche virus disease occurred between 2019 and 2021 in four cities in the country: Cúcuta (3 cases), Cali (3 cases), Leticia (43 cases) and Villavicencio (38 cases) which were identified through retrospective laboratory analysis of samples from cases of acute febrile illness. The cases were confirmed using different serological, molecular and metagenomic sequencing techniques at the One Health Genomic Laboratory of the National University of Colombia Medellín Campus and their results were corroborated by the National Reference Laboratory of the National Institute of Health in 2023. Regarding the characterization of the cases, 35.6% (n=31) correspond to the 18-29 age group, 52% (n=45) are men, and 91.2% (n=80) of the cases correspond to samples collected in 2021 (6.7).

In **Peru**, from 2016 to 2022, 94 cases of Oropouche were reported in 6 departments of the country: Madre de Dios, Cusco, San Martín, Cajamarca, Loreto and Ayacucho. In 2022, 8 cases were reported. Of the total accumulated cases, 45% occurred in 2016, the year with the highest cumulative incidence rate of 0.14 cases per 100,000 population, with outbreaks reported in Madre de Dios, Cusco and Ayacucho (8).

## Guidance to Member States

The Pan American Health Organization / World Health Organization urges Member States to intensify surveillance for the timely detection of cases, update health personnel for the detection and proper management of cases and inform the at-risk population about preventive and control measures.

Given its clinical presentation and taking into account the current situation of dengue and other prevalent vector-borne diseases in the Region of the Americas (9), a crucial aspect for confirming cases, characterizing an outbreak, and monitoring disease trends is the implementation of laboratory diagnosis. Below are the main recommendations for laboratory surveillance, as well as prevention and control measures.

### Laboratory diagnosis and surveillance (10,11)

The OROV virus has a segmented genome with three segments known as S (small), M (medium), and L (large). During the acute phase of the disease, which usually lasts between 2 and 7 days, it is possible to detect the genetic material of the virus (RNA) by molecular methods (RT-PCR) in serum samples. Although it is also possible to detect RNA in cerebrospinal fluid (CSF) in cases presenting with aseptic meningitis (a rare complication of Oropouche fever), the CSF sample should only be taken on medical indication. Most molecular methods are based on the detection of the conserved genetic segment S.

On the other hand, viral isolation can be done with the same samples used for RT-PCR by intracerebral inoculation in lactating mice or by inoculation in Vero cell cultures or C6/36 cell cultures. However, viral isolation is not considered a diagnostic method, but rather a tool for further characterization and investigation, and therefore is not routinely applied or a requirement for confirmation of diagnosis.

Regarding serological methods, antibodies against OROV can generally be detected in serum from the fifth day after the onset of symptoms. The serological diagnosis of OROV is

based on home (in-house) methods, such as plaque reduction neutralization (PRNT), complement fixation, immunofluorescence, hemagglutination inhibition, and IgM and IgG ELISA. Antibodies can also be detected in available or medically collected CSF samples. However, the availability of reagents for serological methods is extremely limited. Therefore, it is recommended to prioritize and use molecular methods (RT-PCR), as long as appropriate samples are available.

Given the clinical presentation of Oropouche fever, for detection and follow-up, it is suggested to process acute samples (up to 7 days after the onset of symptoms) from dengue surveillance, which meet a definition of a suspected case of dengue, but which are negative for the molecular detection of dengue virus. Depending on laboratory capacity and epidemiological context, a percentage of acute-negative samples may be processed for molecular detection of dengue (which may range from 10% to 30%) or a limited number of representative samples.

### *Genomic surveillance*

Due to the segmented nature of its genome, the OROV virus is subject to genomic rearrangement, an important phenomenon that generates viral diversity within the species *Orthobunyavirus oropoucheense*. Thus, several recombinants have been described within this species such as the Iquitos, Madre de Dios and Perdões viruses, which contain the same L and S segments as OROV but different M segments. For this reason and to expand the knowledge of this virus, genomic surveillance can also be implemented where there is capacity and without neglecting the priority of diagnosis and timely detection.

### *Notification under the International Health Regulations*

Given that it is an emerging and poorly identified arbovirus in the Americas, the detection of a positive sample and confirmation of a case requires the use of Annex 2 of the IHR and its consequent notification through the established channels of the International Health Regulations.

## **Vector prevention and control**

Proximity of mosquito breeding sites to places of human habitation is a major risk factor for OROV infection. Vector control measures focus on reducing mosquito populations by identifying and eliminating vector development and resting sites. These measures include:

- The promotion of good agricultural practices to avoid the accumulation of residues that serve as breeding and resting sites.
- Filling or draining water collections, ponds, or temporary flooding sites that may serve as sites of female oviposition and breeding sites for mosquito larvae.
- Elimination of weeds around the premises to reduce mosquito resting and shelter sites.

In addition, measures should be taken to prevent vector bites. These measures include:

- Protection of homes with fine-mesh mosquito nets on doors and windows, in this way other arboviruses are also prevented.

- Use of clothing that covers the legs and arms, especially in homes where someone is sick.
- Use of repellents containing DEET, IR3535 or Icaridin, which may be applied to exposed skin or clothing, and their use must be in strict accordance with the instructions on the product label.
- Use of insecticide-treated or non-insecticide nets for daytime sleepers (e.g., pregnant women, infants, sick or bedridden people, elderly).
- In outbreak situations, outdoor activities should be avoided during the period of greatest mosquito activity (dawn and dusk).
- In the case of people at higher risk of being bitten such as forestry workers, agricultural workers, etc. It is recommended to wear garments that cover exposed parts of the body.

Finally, considering 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 the data from entomological surveillance and the variables that may condition an increase in the risk of transmission. In areas of transmission, insecticide spraying may be an additional measure, where technically advisable and feasible.

## References

1. Pan American Health Organization / World Health Organization. Epidemiological Alert: Outbreak of Oropouche fever. 22 June 2010. Washington, D.C.: PAHO/WHO; 2010. Available in Spanish from: <https://www.paho.org/es/documentos/alerta-epidemiologica-brote-fiebre-oropouche-22-junio-2010>
2. Romero-Alvarez D, Escobar LE. Oropouche fever, an emergent disease from the Americas. *Microbes and Infection*. March 2018; 20(3):135-46.
3. Sakkas H, Bozidis P, Franks A, Papadopoulou C. Oropouche Fever: A Review. *Viruses*. 2018; 10(4):175. Available from: <https://doi.org/10.3390/v10040175>.
4. Health Surveillance Foundation of Amazonas "Dr. Rosemary Costa Pinto" (FVSRCP). Epidemiological Alert No. 1/2024. Manaus; 2024. Available in Portuguese from: [https://www.fvs.am.gov.br/media/publicacao/ALERTA\\_EPIDEMIOLOGICO\\_N%C2%B4\\_01.2024\\_-\\_CIRCULACAO\\_DO\\_VIRUS\\_OROPOUCHE\\_NO\\_AMAZONAS.pdf](https://www.fvs.am.gov.br/media/publicacao/ALERTA_EPIDEMIOLOGICO_N%C2%B4_01.2024_-_CIRCULACAO_DO_VIRUS_OROPOUCHE_NO_AMAZONAS.pdf)
5. Brazil International Health Regulations (IHR) National Focal Point (NFP). Communication received on 2 February 2024 by email. Brasilia; 2024. Unpublished.
6. Karl A. Ciuoderis, Michael G. Berg, Lester J. Perez, Abbas Hadji, Laura S. Perez-Restrepo, Leidi Carvajal Aristizabal, Kenn Forberg, Julie Yamaguchi, Andres Cardona, Sonja Weiss, Xiaoxing Qiu, Juan Pablo Hernandez-Ortiz, Francisco Averhoff, Gavin A. Cloherty & Jorge E. Osorio (2022). Oropouche virus as an emerging cause of acute febrile illness in Colombia, *Emerging Microbes & Infections*, 11:1, 2645-2657. 2022. DOI: 10.1080/22221751.2022.2136536

7. Colombia International Health Regulations (IHR) National Focal Point (NFP). Communication received on 18 January 2023 via email. Bogota; 2023. Unpublished.
8. Peru International Health Regulations (IHR) National Focal Point (NFP). Communication received on 31 January 2024 by email. Lima; 2024. Unpublished.
9. Pan American Health Organization / World Health Organization. Dengue fever. Washington, D.C.: PAHO/WHO; undated. Available from: <https://www.paho.org/en/topics/dengue>
10. Pan American Health Organization. Recommendations for Laboratory Detection and Diagnosis of Arbovirus Infections in the Region of the Americas. Washington, D.C.; 2022. Available in Spanish from: <https://doi.org/10.37774/9789275325872>.
11. Naveca FG, Nascimento VAD, Souza VC, Nunes BT, Rodrigues DSG, Vasconcelos P. Multiplexed reverse transcription real-time polymerase chain reaction for simultaneous detection of Mayaro, Oropouche, and Oropouche-like viruses. Mem Inst Oswaldo Cruz. 2017; 112(7):510-3