

### Background in the Region of the Americas

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

It is possible that the circulation of Oropouche virus includes both urban epidemic (affecting humans) and sylvatic (epizootic) cycles. In the sylvatic cycle, primates, sloths, and, occasionally, birds act as vertebrate hosts, while no definitive arthropod vector has been identified. In its urban epidemic cycle, OROV is mainly transmitted through the bite of the *Culicoides paraensis* midge that is present in the region, as well as the *Culex quinquefasciatus* mosquito, which can also be a vector; humans act as the amplifying host (1,2,3).

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

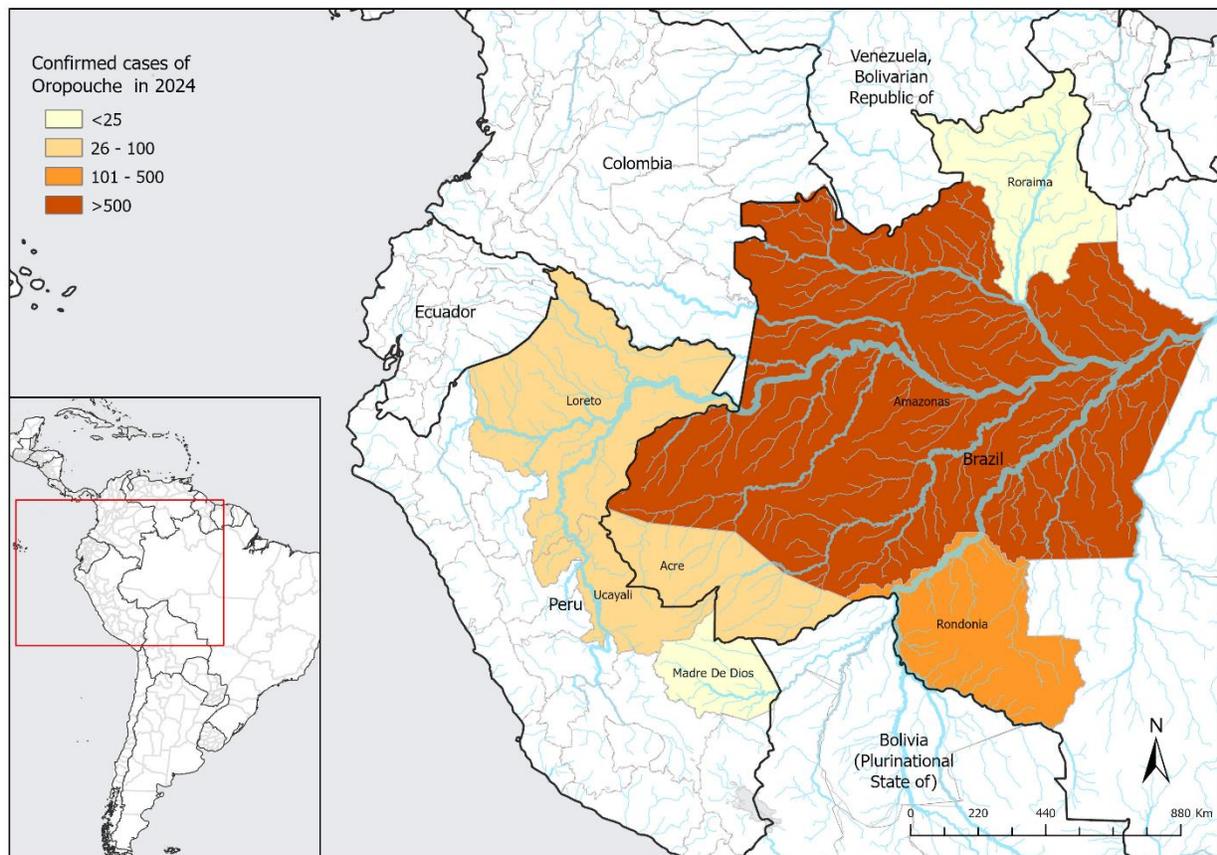
### Situation summary

On 2 February 2024, the **Brazil** IHR National Focal Point (NFP) first notified the occurrence of cases of OROV disease in the state of Amazonas and that additional OROV cases reported in the states of Acre and Roraima were being investigated (4).

On 5 March 2024, Brazil's IHR NFP informed that, as of 2023, the detection of OROV cases in the states of the Amazon region, where the disease is considered endemic, has increased as a result of the decentralization of biomolecular diagnosis apart from the country's Central Public Health Laboratories (LACEN per its acronym in Portuguese). In 2023, 773 samples were diagnosed with OROV by molecular biology (RT-qPCR) (5).

In Brazil, between epidemiological week (EW) 1 and EW 8 of 2024, OROV was detected in 2,104 samples, of which 1,821 correspond to the state of Amazonas, 172 to Rondônia, 51 to Acre, and 12 to Roraima. It should be noted that all cases detected in 2023 and 2024 had a probable site of infection in states of the Northern region of Brazil (Acre, Amazonas, Pará, Rondônia and Roraima), including cases reported in states of other regions of the country, in people who visited those states (5).

**Map.** Distribution of Oropouche confirmed cases in Brazil and Peru, 2024



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 Map production: PAHO Health Emergencies Department, Health Emergency Information and Risk Assessment Unit, GIS Team.

**Source:** Adapted from reports sent by the International Health Regulations National Focal Points (IHR NFPs) of Brazil and Peru.

In **Peru**, between 2016 and 2022, 94 cases of Oropouche were reported in 6 departments of the country: Madre de Dios, Cusco, San Martín, Cajamarca, Loreto, and Ayacucho. Of the total accumulated cases, 45% occurred in 2016, related to outbreaks in Madre de Dios, Cusco and Ayacucho (6).

In 2024, between EW 1 and EW 8, 146 cases of OROV were reported in the departments of Loreto, Ucayali, and Madre de Dios, the highest number of cases reported to date in this country. The provinces where confirmed cases were reported are: Maynas, Loreto (n=74); Coronel Portillo, Ucayali (n=38); Tambopata, Madre de Dios (n=14); Mariscal Ramón Castilla, Loreto (n=6); Tahuamanu, Madre de Dios (n=4); Atalaya, Ucayali (n=4); Padre Abad, Ucayali (n=4); and Datem del Marañón, Loreto (n=2) (7).

## Guidance to Member States

The Pan-American Health Organization / World Health Organization (PAHO/WHO) 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 considering the current situation of dengue and other prevalent vector-borne diseases in the Region of the Americas (8), 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.

### Clinical diagnosis and management (9)

After an incubation period of between 5 and 7 days, patients experience high fever, headache with photophobia, myalgia, arthralgia, and, in some cases, rash. In certain patients, symptoms may be more severe and include vomiting and bleeding, manifesting as petechiae, epistaxis and gingival bleeding. Generally, the infection resolves within 2 to 3 weeks. In exceptional situations, OROV can cause meningitis or encephalitis. In these cases, patients show neurological symptoms and signs such as vertigo, lethargy, nystagmus and neck stiffness. The virus can be detected in cerebrospinal fluid (CSF).

During the first week of illness, the main differential diagnosis is dengue infection. In the second week of illness, the clinical differential diagnosis should consider the possibility of meningitis and encephalitis.

Currently, no specific vaccines or antiviral drugs are available to prevent or treat OROV infection. The treatment approach is palliative, focusing on pain relief, rehydration and control of any vomiting that may occur. In situations where the disease manifests itself in a neuroinvasive form, the patient will need to be admitted to specialized units that allow constant monitoring.

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

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 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 infrequently 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 (12).

### **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 (13,14,15):

- Strengthen entomological surveillance for the detection of species with vector potential and the timely mapping of areas with conditions for vector development and transmission.
- 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 (14,15,16):

- 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, as well as the use of the previously mentioned repellents.

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.

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