衞生防護中心
Centre for Health Protection

Scientific Committee on Vector-borne Diseases

Epidemiology, Prevention and Control of Oropouche Fever

Purpose

In view of the expansion of Oropouche virus transmission across the Americas since late 2023, this paper reviews the global and local epidemiological situation, assesses the risk to Hong Kong, and outlines the prevention and control measures.

Background

2. Oropouche fever is an acute viral disease caused by the Oropouche virus (OROV), a segmented single-stranded RNA virus belonging to the Simbu serogroup of the genus *Orthobunyavirus* in the family *Peribunyaviridae*[1]. The virus was first identified in 1955 in Vega de Oropouche, a village near the Oropouche River in Trinidad and Tobago (in the southern Caribbean) and is predominantly found in Central and South America and the Caribbean[2].

Transmission

3. OROV is transmitted to humans primarily through the bite of infected *Culicoides paraensis* (*C. paraensis*) midges. This primary vector is distributed across the Americas, but has not been reported in Europe or Asia. In addition, *Culex quinquefasciatus* (*Cx. quinquefasciatus*), *Coquillettidia venezuelensis* (*Cq. venezuelensis*) and *Aedes serratus* (*Ae. serratus*) mosquitoes have also been implicated as potential vectors. However, their roles in natural transmission remain uncertain, and laboratory studies generally indicate low vector competence in *Cx. quinquefasciatus*[3].

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4. Two transmission cycles have been described for OROV: the sylvatic cycle and the urban cycle[4].

i. The sylvatic cycle involves non-human vertebrate hosts and arthropod vectors in forested areas. *Cq. venezuelensis* and *Ae. serratus* has been implicated as possible vectors. The animal reservoirs in the sylvatic cycle remain unclear, although evidence of infection has been found in non-human primates, sloths and birds. No definitive arthropod vector has been identified.

ii. The urban cycle primarily involves transmission between humans and *C. paraensis* biting midges. *Cx. Quinquefasciatus* has also been implicated as a potential urban vector. Human acts as amplifying hosts: vectors may acquire the virus when feeding on viraemic individuals and subsequently transmit the virus to other people.

5. There is no evidence that OROV spreads between people through respiratory droplets or ordinary skin contact. However, vertical transmission from infected mothers to their foetuses have been reported in Brazil during the recent outbreak. Laboratory-acquired infections have also been documented in two laboratory workers through aerosolisation or ingestion during handling of infectious materials[5]. Furthermore, replication-competent OROV has been detected in semen, and viral RNA has been detected in semen and vaginal secretions. These findings raise concern about possible sexual transmission, but no such transmission has been documented[6].

Clinical features

6. The incubation period for Oropouche fever is typically three to ten days. The clinical features of Oropouche fever overlap with those of dengue fever, chikungunya fever and Zika virus infection. Patients may present with fever, headache, chills, muscle pain, joint pain, rash, and vomiting[2]. Other less common symptoms include photophobia, retroorbital pain, diarrhoea and haemorrhagic manifestations. Symptoms usually last for less than a week. However, up to 60% of cases experience a relapse of symptoms days or weeks after initial recovery[7].

7. The symptoms of Oropouche fever are typically mild and deaths are rare. However, some patients can develop neurological complications after OROV infection, including meningitis and encephalitis. Guillain-Barré syndrome has also been reported following OROV infection, although the association requires further investigation[8]. Evidence suggested that up to 4% of patients develop neurological symptoms such as intense occipital pain, dizziness, confusion and photophobia. In pregnant women, OROV infection has been associated with adverse foetal outcomes, including congenital anomalies (such as microcephaly) and foetal death[7].

Diagnosis

8. Oropouche fever can be diagnosed by real-time reverse transcription polymerase chain reaction (RT-PCR) to detect viral RNA in serum or cerebrospinal fluid, preferably collected within 2–7 days of symptom onset. Serology testing demonstrating 4-fold or greater rise in antibody titres can also aid diagnosis. Testing should be guided by the timing of illness, clinical presentation and travel history, with parallel assessment for other relevant causes of fever, including dengue fever, chikungunya fever, Zika virus infection, yellow fever and malaria. Suspected cases with compatible symptoms and travel history but tested negative for the aforementioned diseases should be reported to the Centre for Health Protection (CHP) for further investigation and follow-up.

Treatment

9. There is no specific antiviral treatment for Oropouche fever. Management is directed primarily at relieving the symptoms, including using anti-pyretics, analgesics and replacement of fluids. Patients should be advised to avoid aspirin-containing drugs or other non-steroidal anti-inflammatory drugs to reduce the risk of bleeding. No registered vaccines are available for Oropouche fever at the moment. Prevention therefore focuses on avoiding midge and mosquito bites, and reducing vector breeding.

Global situation

10. Oropouche fever has historically been endemic to the Amazon basin. It was considered the second most common arboviral disease in South America after dengue fever before the emergence of chikungunya fever and Zika virus

infection in 2013 and 2015 respectively[2]. The first documented epidemic of Oropouche fever occurred in 1961 in Brazil, involving an estimated 11,000 cases. Since then, over 500,000 cases have been recorded across the Americas. The true burden is likely underestimated because of limited diagnostic testing and the clinical overlap with other endemic arboviral diseases[9]. Outbreaks have also been recorded in Bolivia, Colombia, Ecuador, French Guiana, Panama and Peru and Venezuela[2].

11. Since late 2023, reported cases of Oropouche fever have increased markedly in the Americas, including in areas where transmission had not been documented previously. (Figure 1)

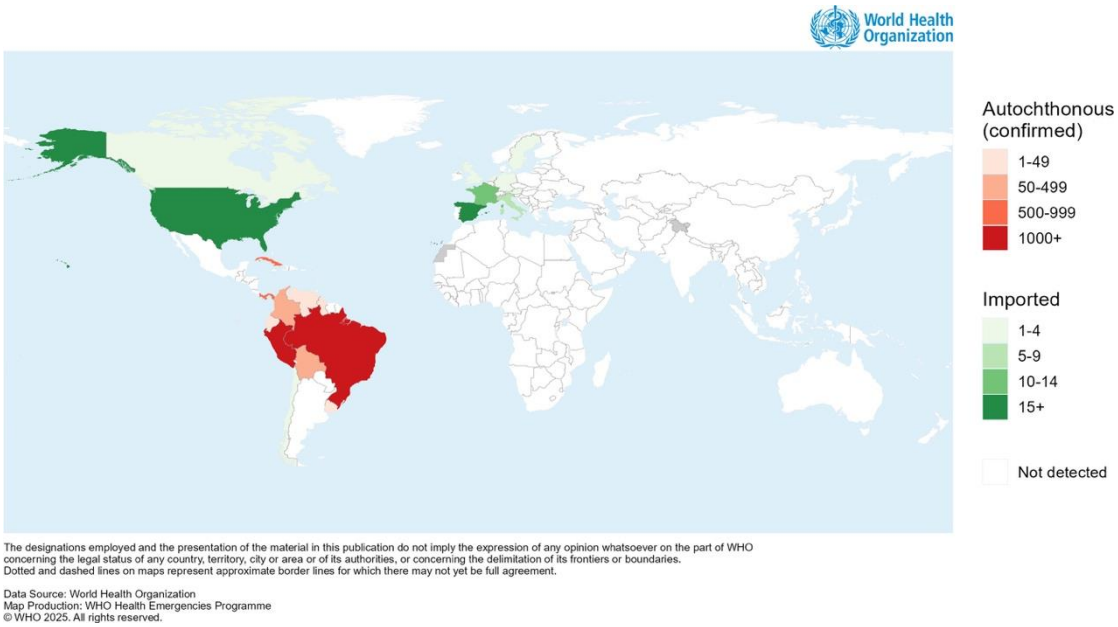


Figure 1. Geographical distribution of reported cases of Oropouche fever, 2024–2025.
Source: Subissi et al. (2026). Oropouche virus: transmission, epidemiology, genetic diversity, and public health implications. EClinicalMedicine, 95, 103871. https://doi.org/10.1016/j.eclinm.2026.103871
(The borders of the People's Republic of China shown on the related maps do not represent Government's official position)

Situation in Americas

12. In 2024, 16,128 confirmed locally acquired cases of Oropouche fever were recorded in nine countries in the Americas, including Brazil (13,785 cases), Peru (1,263 cases), Cuba (626 cases), Bolivia (356 cases), Colombia (74 cases), Panama (16 cases), Ecuador (3 cases), Guyana (3 cases) and Barbados (2 cases). Between week 1 and week 30 of 2025, 12,779 confirmed locally acquired cases were reported in seven countries in the Americas, including Brazil (11,888 cases), Panama (501 cases), Peru (330 cases), Cuba (28 cases), Colombia (26 cases), Venezuela (5 cases) and Guyana (1 case)[10].

Table 1. Number of confirmed locally acquired cases of Oropouche fever in the Americas, 2024 – 2025*

Countries/Areas	Reported number of cases in 2024	Reported number of cases between week 1 and week 30 in 2025
Barbados	2	-
Bolivia	356	-
Brazil	13 785	11 888
Columbia	74	26
Cuba	626	28
Ecuador	3	-
Guyana	3	1
Panama	16	501
Peru	1 263	330
Venezuela	-	5

* Data from Week 1 to Week 30

13. Two major waves were observed in the reported case series. (Figure 2) The first wave occurred in early 2024, when Brazil reported around 400-500 cases per week and Peru around 50-140 cases per week. The number of confirmed cases then declined gradually before a second upsurge began around week 40 of 2024. The second wave reached its peak in week 3 of 2025 at approximately 1,100 cases per week, which nearly doubled the peak of the first wave (around 600 cases in week 9 of 2024).

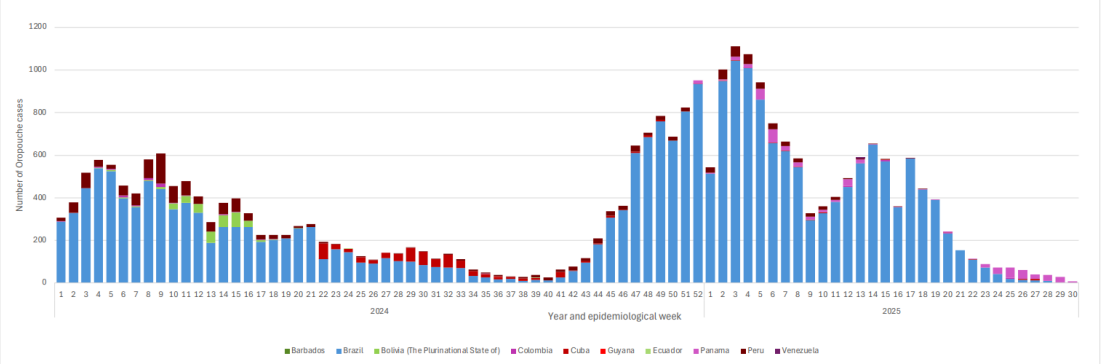


Figure 2. Number of confirmed autochthonous cases of Oropouche fever by country and epidemiological week of symptom onset, the Americas, 2024–2025*.
* Data from Week 1 to Week 30
Source: PAHO (2025). Epidemiological Update Oropouche in the Region of the Americas August 13, 2025.

14. Brazil reported the largest number of confirmed autochthonous cases, accounting for nearly 90% (25,673 cases) of all cases recorded in the Americas from 2024 to week 30 of 2025. The two waves had distinct epicentres: about 40% of the cases recorded in Brazil in 2024 were in the Amazon region (northwest of Brazil)[11], while more than half (53%) of the cases in 2025 were recorded in Espírito Santo (southeastern Brazil)[12], reflecting geographical expansion beyond the Amazon basin. (Figure 3)

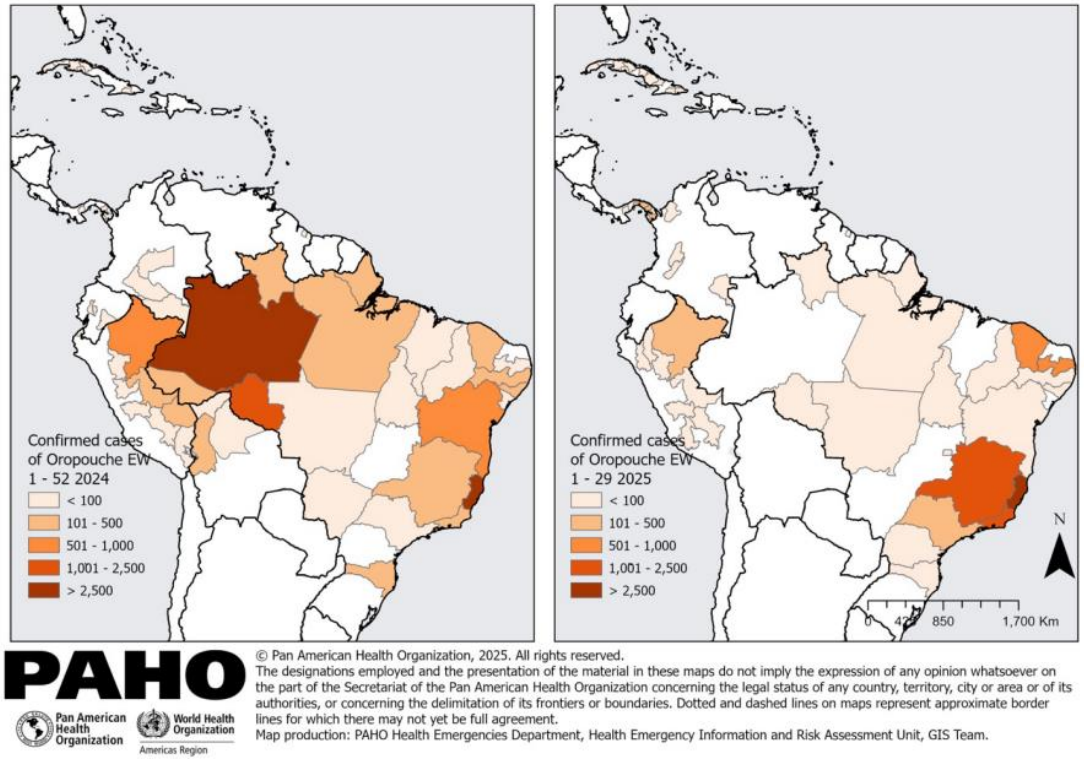


Figure 3. Geographic distribution of autochthonous Oropouche fever cases in the America, 2024–2025*.
Left (2024): All seven states in the Amazon region (northwestern Brazil) reported cases; the state of Amazonas (dark brown) recorded the highest number of cases within the region (>2,500).
Right (2025*): The state of Espírito Santo (southeastern Brazil; dark brown) recorded the highest number of cases nationwide (>2,500).
* Data from Week 1 to Week 30 for Brazil
Source: PAHO (2025). Epidemiological Update Oropouche in the Region of the Americas August 13, 2025.

15. In 2024, Brazil recorded four deaths associated with OROV infection, including two previously healthy women aged 24 and 20 years. Both patients presented with haemorrhagic manifestations similar to those of severe dengue fever, deteriorated rapidly and died within the first week of symptom onset[13]. Additionally, four cases of foetal death and one case of congenital anomaly were confirmed to be associated with OROV infection[11]. In 2025, Brazil reported a total of seven deaths associated with OROV infection[14].

Situation in North America and Europe

16. Imported cases of Oropouche fever were first recorded in North America and Europe in 2024. The United States Centers for Disease Control and Prevention reported 108 imported cases in 2024 and two imported cases in 2025[15]. Canada reported two imported cases in 2024 and one imported case in 2025[10].

17. From 2024 to week 34 of 2025, 53 imported cases were recorded across eight European countries. Spain reported the highest number of cases (23 cases), followed by France (11 cases) and Italy (8 cases). Over 80% (43 cases) had a travel history to Cuba. According to the European Centre for Disease Prevention and Control, while *C. paraensis* is widely distributed across the Americas, it is absent from Europe. The risk of local transmission of OROV is therefore low despite possible importation of cases from endemic areas[16].

18. No locally acquired cases of Oropouche fever have been recorded in North America and Europe so far.

Situation in Asia

19. *C. paraensis* has not been reported in Asia, and no autochthonous Oropouche fever cases have been reported in the region so far. However, the expanding outbreak in the Americas and the detection of imported cases in North America and Europe underscore the potential for international spread via travel. A modelling study suggested that climate and environmental change could increase the suitability of some areas of Asia for *C. paraensis* and OROV. Such projections are conditional on introduction and establishment and do not demonstrate current transmission risk[17].

20. In the Chinese Mainland, 350 species of *Culicoides* midges have been identified and are widely distributed across the country, but *C. paraensis* is not among them. On the other hand, the mosquito *Cx. quinquefasciatus* is widely distributed across the Chinese Mainland. According to a study, the average capture density for *Cx. quinquefasciatus* in Guangdong Province is 0.95 per lamp-hour a year and it accounted for 89.9% of mosquitoes captured, indicating that it is a dominant mosquito species in the area[18]. However, laboratory findings indicate that the vector competence of *Cx. quinquefasciatus* for OROV is relatively low compared with that of the primary midge vector[19,20]. According to the risk assessment by the Chinese Center for Disease Control and Prevention in September 2024, the risk of importation of Oropouche fever and subsequent local transmission in the Chinese Mainland is low[21].

Local situation and Risk Assessment

21. In Hong Kong, no cases of Oropouche fever have been recorded to date. The Food and Environmental Hygiene Department (FEHD) conducted an

extensive, territory-wide survey on biting midges from July 2017 to July 2018 to study the seasonal variation and local distribution of biting midges, and to assess the public health implications of potential disease vectors[22]. According to the FEHD, at least 57 species from 10 genera of biting midges have been recorded in Hong Kong[23]. Neither *C. paraensis* nor other members in the subgenus group was found in the surveys[24].

22. On the other hand, *Cx. quinquefasciatus* is a common mosquito species in Hong Kong[25]. Nonetheless, evidence from laboratory studies indicated that it is not a highly competent vector for OROV[19,20]. According to the World Health Organization (WHO), the overall risk for regions with potential secondary vectors (e.g. *Cx. quinquefasciatus*) but lacking the primary vector (*C. paraensis*) is low[26]. The risk of a local outbreak of Oropouche fever in Hong Kong is therefore considered to be low.

Prevention and control of Oropouche fever

23. In response to the Oropouche fever outbreaks in 2024-2025, the WHO and the Pan American Health Organization (PAHO) have issued multiple epidemiological alerts[27-31], updates[10-11,32-35], and technical documents to keep Member States informed of the latest situation and to urge them to strengthen surveillance, vector control and personal protection measures.

Enhanced diagnosis and case surveillance

24. Strengthening epidemiological surveillance and laboratory diagnosis is crucial for timely detection and reporting of cases, particularly for severe or fatal cases and suspected vertical transmission. In Hong Kong, the Public Health Laboratory Services Branch of the CHP has the capacity to test for OROV in suspected patients.

25. Vertical transmission associated with foetal death and congenital anomalies was documented during the 2024-2025 outbreak of Oropouche fever. Following these reports, PAHO promptly issued an epidemiological alert[29] to remind Member States to remain vigilant, and published the *Recommendations for the Detection and Surveillance of Oropouche in possible cases of vertical infection, congenital malformation, or foetal death* to provide guidance on the laboratory diagnosis and surveillance of OROV in pregnant women, as well as in cases associated with congenital abnormalities or foetal death.

Vector control

26. Vector surveillance is important for monitoring established vectors and identifying potential new vectors, especially in areas at risk of transmission. The PAHO has published the *Interim guidance on entomological surveillance and prevention measures for Oropouche virus vectors*, which addresses the bionomics and life cycles, surveillance and control of the vectors[36].

Personal protection measures

27. The following preventive measures against midge and mosquito bites are advised:

- Use fine-mesh screens (with holes smaller than 1 millimetre) on doors, windows and beds. Standard bed nets are less effective against the biting midges as the biting midges are small and can pass through the netting;
- Wear loose, long-sleeved tops and trousers that cover arms and legs;
- Use insect repellents that contain DEET, IR3535, or icaridin on exposed parts of the body and clothing:
    - Pregnant women and children of 6 months or older can use DEET-containing insect repellent. In general, use DEET of up to 30% for pregnant women and up to 10% for children;
    - For children who travel to countries or areas where vector-borne diseases are endemic or epidemic and where exposure is likely, children aged 2 months or above can use DEET-containing insect repellents with a concentration of DEET up to 30%;
    - Avoid using fragrant cosmetics or skin care products;
    - Re-apply insect repellents according to instructions;
    - If both insect repellents and sunscreen are used, apply insect repellents after sunscreen.

28. When travelling to affected areas, travellers should take preventive measures to avoid midge and mosquito bites during travel and for three weeks after returning[37]. Travellers should also consider using condoms or avoiding sexual activity during travel and for six weeks after return to prevent possible sexual transmission. Those who develop compatible symptoms should seek

medical advice and consider these precautions for at least six weeks after symptom onset[37].

Way Forward

29. In January 2025, the PAHO convened a regional meeting with experts from PAHO Collaborating Centres for arboviruses and from Brazil, Colombia, Cuba, Peru and Ecuador to define a strategic research agenda for OROV[38]. The meeting identified critical knowledge gaps and outlined key strategies to guide future evidence-based efforts in the Region. Proposed priority research areas included maternal-foetal outcomes of Oropouche fever, identification of risk factors associated with severe outcomes, development of advanced diagnostic tools, and vector competence.

30. At the global level, the WHO working group highlighted 12 priorities for research and development across four themes: vector research, virology and pathogenesis, serology and diagnostics, and animal models, vaccines, and therapeutics[39]. The roadmap is intended to serve as a framework to guide research and accelerate the development of medical countermeasures from basic research through licensure to early product use.

Summary

31. Oropouche fever is an emerging arboviral disease that has undergone unprecedented geographical expansion since late 2023, with large outbreaks reported in South America, Central America and the Caribbean and imported cases documented in North America and Europe. The virus has demonstrated the capacity to cause significant outbreaks with serious complications, including neuroinvasive disease, vertical transmission associated with foetal death and congenital anomalies, and fatal outcomes in previously healthy adults. Further research into the epidemiology, prevention and control of Oropouche fever is warranted.

32. As an international city with high volume of inbound travellers from around the globe, the risk of importation of Oropouche fever to Hong Kong exists. However, as the primary vector has not been detected locally and available evidence suggests low competence of potential secondary vectors, the risk of a local outbreak is considered to be low. The Centre for Health Protection

of the Department of Health will continue to monitor the global epidemiological situation of Oropouche fever and regularly review the risks of importation and local transmission.

Centre for Health Protection
Department of Health
October 2026

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