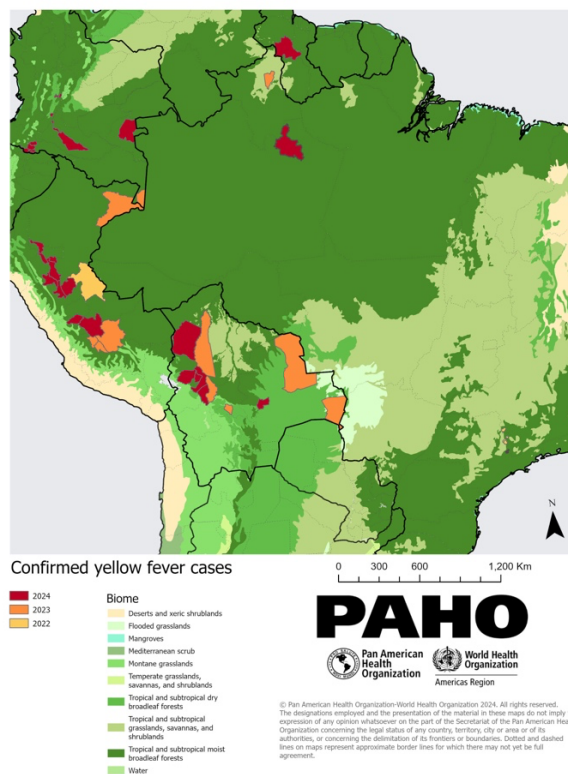


### Summary of the situation

Between epidemiological week (EW) 1 and EW 44 of 2024, 50 confirmed cases of yellow fever in humans have been reported in the Americas Region, including 24 deaths. This represents 12 additional cases (one in the Plurinational State of Bolivia, nine in Colombia, one in Guyana, and one in Peru) and five additional deaths (one in Bolivia and four in Colombia) since the previous Pan American Health Organization/World Health Organization (PAHO/WHO) yellow fever epidemiological update published on 19 September 2024 (1). The 50 cases were reported from five countries in the Region: Bolivia (eight cases, including four deaths), Brazil (three cases, including two deaths), Colombia (17 cases, including nine deaths), Guyana (three cases), and Peru (19 cases, including nine deaths) (2- 9).

Cases were reported mainly throughout the Amazon region in Bolivia, Brazil, Colombia, Guyana, and Peru (**Figures 1 and 2**).

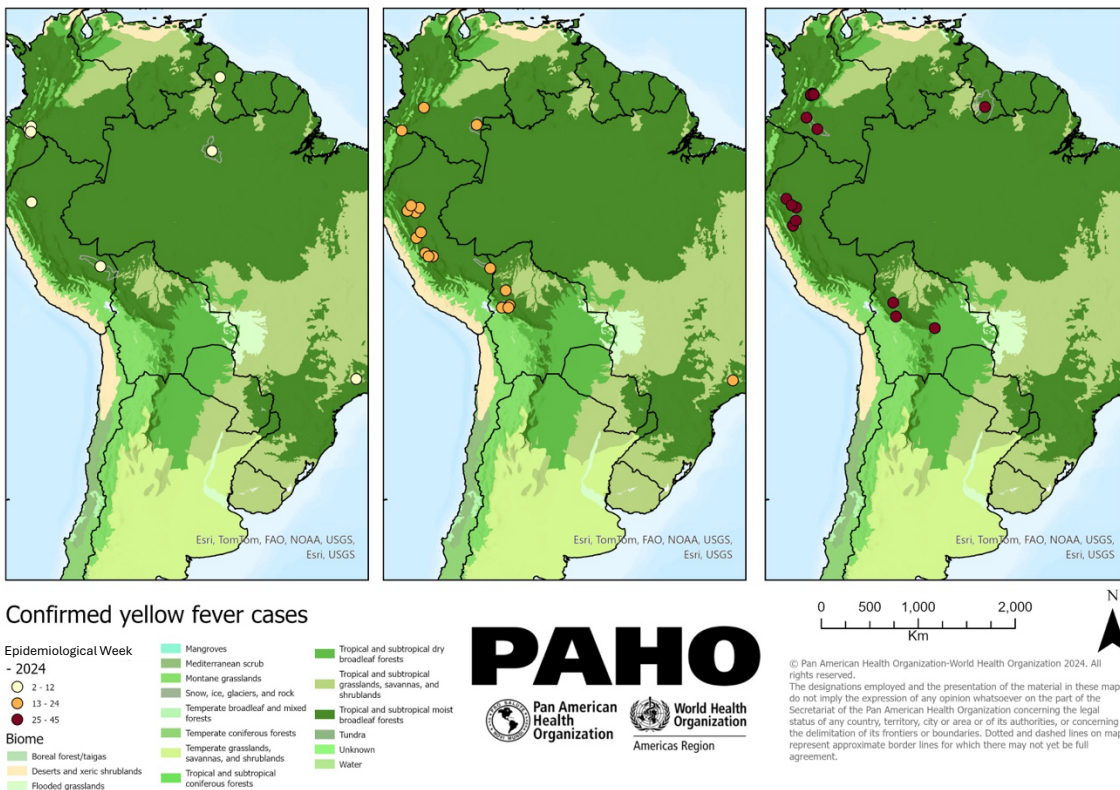
**Figure 1.** Geographical distribution of municipalities with occurrence of confirmed yellow fever cases in humans in Bolivia, Brazil, Colombia, Guyana, and Peru, during 2022, 2023, and 2024 (as of epidemiological week [EW] 44).



**Source:** Adapted from data provided by countries or published by Ministries of Health and reproduced by PAHO/WHO (2- 9).

**Suggested citation:** Pan American Health Organization / World Health Organization. Epidemiological Update: Yellow fever in the Americas Region, 6 November 2024, Washington, D.C. PAHO/WHO. 2024.

**Figure 2.** Geographic distribution of confirmed yellow fever cases in humans by EW in the Americas Region, between January 2024 and November 2024.



**Source:** Adapted from data provided by countries or published by Ministries of Health and reproduced by PAHO/WHO (2- 9).

The following is an update of the epidemiological situation of yellow fever in the countries that have reported confirmed cases in 2024.

In **Bolivia**, between EW 1 and EW 44 of 2024, eight confirmed cases of yellow fever have been reported (seven confirmed by laboratory and one through clinical-epidemiological link), including four deaths. The cases correspond to seven males and one female, aged between 15 and 64 years old, with symptom onset between 20 April and 19 September 2024. Only three of the cases had a history of vaccination, and all had a history of exposure to wild and/or wooded areas, due to work activities, amongst other reasons. The cases had probable sites of exposure in La Paz department in the municipalities of Caranavi (n= 2 fatal cases), Guanay (n= 1 case), San Buenaventura (n= 1 fatal case), Palos Blancos (n= 1 case), and Inquisivi (n= 1 fatal case), and in Santa Cruz department, in the municipality of Porongo (n= 2 cases). One confirmed death due to yellow fever has been reported since the last update (2).

In **Brazil**, between EW 1 and EW 43 of 2024, three confirmed cases of yellow fever, including two deaths, have been reported in the states of Amazonas (n= 1 fatal case), Minas Gerais (n= 1 fatal case), and São Paulo (n= 1 case). The first case corresponds to a 63-year-old male resident of Presidente Figueiredo, Amazonas State with no history of vaccination for yellow fever, and who had symptom onset on 5 February 2024 and died on 10 February 2024. The second case corresponds to a 50-year-old male with no history of vaccination for yellow fever who was a resident of Águas de Lindóia, São Paulo State, and had a probable site of exposure in Monte Sião, Minas Gerais state, with symptom onset on 23 March 2024 and died on 29 March 2024. The third case corresponds to a 28-year-old male with a history of

vaccination for yellow fever received in 2017, resident of the municipality of Serra Negra, São Paulo State, and who had symptom onset on 1 April 2024 and has since recovered from the disease. All cases had a history of exposure to wild and/or forested areas due to work activities and were laboratory confirmed by RT-PCR. During the monitoring period between July 2023 and June 2024, 1,820 events involving deaths among non-human primates (epizootics) were reported. Of these, 11 (0.6%) were confirmed for yellow fever by laboratory criteria, six in the state of Rio Grande do Sul and five in the state of Minas Gerais. During the monitoring period between July 2024 and as of EW 43 of 2024, 393 events involving deceased non-human primates were reported. Of these, three (0.8%) were confirmed for yellow fever by laboratory criteria, one in the state of Roraima and two in the state of São Paulo (3).

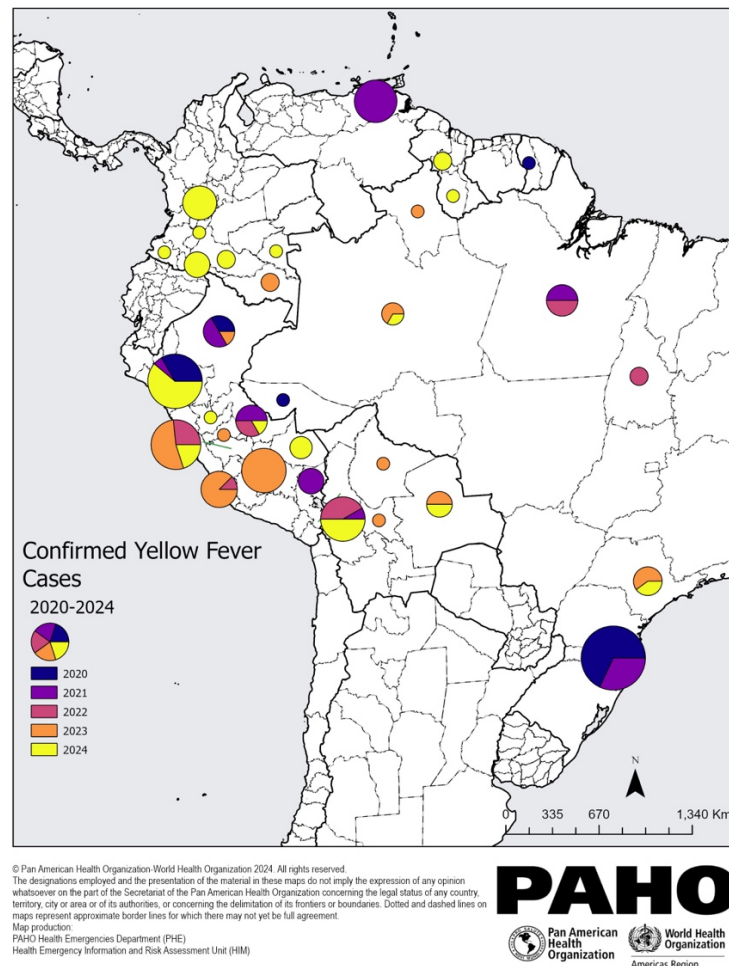
In **Colombia**, between EW 1 and EW 44 of 2024, 17 cases of yellow fever have been identified, of which nine were fatal. Seven cases were reported as probable for yellow fever and ten were detected through differential laboratory diagnosis among cases with negative results for dengue or suspected leptospirosis and confirmed by RT-PCR and/or immunohistochemistry (among deceased cases) for yellow fever. Cases have been reported in six departments: Caquetá (n= 2 cases), Huila (n= 1 case), Nariño (n= 1 case), Putumayo (n= 4 cases), Vaupés (n= 1 case), and most recently, cases have been reported since EW 37 in Tolima (n= 8 cases). The cases correspond to persons aged between 11 and 66 years old with onset of symptoms between 3 January and 19 October 2024. All cases had a history of exposure in areas at risk for yellow fever, such as wild and wooded areas, in the context of work activities that included agriculture (n= 15 cases), stone quarrying (n= 1 case), as well as a female student in a village (n= 1 case). Of these, 15 cases had no documented history of yellow fever vaccination. The recent outbreak in the department of Tolima occurred in the rural area adjacent to the southwestern part of the Bosque de Galilea Regional Natural Park in four municipalities identified as high risk (4): Cunday (n= 3 cases), Prado (n= 2 cases), Purificación (n= 2 cases), and Villarrica (n= 1 case). There were eight confirmed cases, six males between 18 and 63 years old, and one 11-year-old female, with onset of symptoms between 8 September and 27 October 2024. Three deaths were reported in this outbreak (5, 6).

In **Guyana**, three laboratory-confirmed cases were identified between EW 1 and EW 44 of 2024. The first case was identified in EW 11 in Boa Vista, Roraima State, Brazil, in a 17-year-old male resident of the community of Massara, Guyana, 100 km from Lethem, Guyana, which borders Bonfim, Roraima, Brazil, who had a history of vaccination against yellow fever received over 10 years prior. The case works in a rural area of Siparuni (forest region) in Guyana logging trees and presented with onset of symptoms on 29 February 2024. On 12 March, a RT-PCR test confirmed the identification of sylvatic yellow fever virus by the Central Public Health Laboratory of Roraima. The second case was identified in EW 11 during the investigation and through testing performed after the identification of the index case. This case corresponds to a 21-year-old female with a history of yellow fever vaccination received over 10 years prior, and who is a resident of Siparuni, in the same logging camp as the first case. The case presented with onset of symptoms on 13 March 2024 and had a positive result for yellow fever by RT-PCR on 16 March. Both cases recovered. The third case was identified in EW 41, corresponding to a 14-year-old male resident of Awareanau Village in Region 9; the case had a history of vaccination for yellow fever received over 10 years prior. On 7 October, a serological sample was collected, and the presence of yellow fever was confirmed by RT-PCR test; this case is clinically stable (7).

In **Peru**, between EW 1 and EW 44 of 2024, 19 confirmed cases of yellow fever have been reported, including nine deaths. Confirmed cases were reported from Huánuco Department in the Mariano Damaso Beraún District (n= 1 fatal case); Junín Department in the Pichanaqui (n= 2 cases) and Satipo Districts (n= 1 fatal case); Madre de Dios Department in the Tambopata District (n= 3 cases); San Martín Department in the Alto Biavo (n= 1 fatal case), El Porvenir (n= 1 fatal case), Huimbayo (n= 1 case), Lamas (n= 1 fatal case), Moyobamba (n= 1 fatal case), Pinto Recodo (n= 1 case), Saposa (n= 1 fatal case), Shamboyacu (n= 1 case), Shapaja (n= 1 fatal case), Tabaloso (n= 1 fatal case), and Tocache (n=1 case) districts, and in Ucayali Department in the Padre Abad district (n= 1 case). All 19 cases were male between 18 and 83 years of age with onset of symptoms between 11 January and 1 September 2024. All cases had a history of exposure to wild and/or wooded areas due to agricultural work activities and had no history of vaccination for yellow fever (8, 9).

Between 2020 and 2023, all the mentioned countries had a history of yellow fever cases, except for Guyana, which identified cases only in 2024 (**Figure 3**).

**Figure 3.** Geographic distribution of confirmed yellow fever cases in humans in the Americas Region, between January 2020 and November 2024.



**Source:** Adapted from data provided by countries or published by Ministries of Health and reproduced by PAHO/WHO (2-9).

## Recommendations for health authorities

In the Americas Region, the risk of yellow fever outbreaks occurring is high. While immunization is one of the most successful public health interventions to prevent this disease, most of the cases reported during 2024 had no history of yellow fever vaccination.

PAHO/WHO encourages Member States with areas at risk for yellow fever to continue their efforts to strengthen surveillance and vaccination in endemic areas.

It is necessary that countries ensure vaccination coverage of greater than or equal to 95% in the populations in at-risk areas in a homogeneous manner and that health authorities ensure that they have a strategic reserve inventory that allows them to maintain routine vaccination, while at the same time respond to possible outbreaks (10).

### Surveillance

It is recommended that Member States with areas at risk for yellow fever implement the following strategies to strengthen surveillance (11):

- Issue epidemiological alerts to municipalities and health services.
- Conduct an active search for persons with illness compatible with the definition of a suspected case and/or with acute febrile icteric syndrome in the areas where cases have occurred, as well as in the surrounding municipalities and the places visited by the cases in the period of 3 to 6 days prior to the onset of the disease.
- Conduct retrospective investigation of death certificates to detect cases compatible with the case definition.
- Intensify epizootic surveillance actions, since the death of non-human primates can serve as an early warning to identify yellow fever circulation and indicate the need to intensify vaccination actions.

### Clinical management

Yellow fever is a serious viral hemorrhagic disease that represents a challenge for health professionals. It requires early recognition of signs and symptoms, which are often nonspecific and may mimic other acute febrile syndromes (12).

Classic studies on the natural history of the disease show that it is clinically characterized by three phases: 1) *infection phase*, with elevated body temperature; 2) *remission phase*, with the presence of albuminuria; and 3) *toxic phase*, with hemorrhagic manifestations and signs and symptoms of acute liver failure, such as jaundice and hepatic encephalopathy (12).

There is still no specific treatment for yellow fever; therefore, early detection of suspected or confirmed cases, monitoring of vital signs, life support measures, and management of acute liver failure, remain the recommended strategies for case management (12).

## Vaccination

The yellow fever vaccine is safe, affordable, and a single dose is sufficient to confer lifelong immunity and protection, without the need for booster doses (13).

PAHO/WHO reiterates its recommendations to national authorities (14):

- **Universal vaccination** in children in endemic countries at 12 months of age, administered simultaneously with measles, rubella and mumps (MMR) vaccine.
- Endemic countries with scheduled follow-up campaigns for measles/rubella in children under 5 years of age should take the opportunity to **integrate** yellow fever vaccination and administer these two vaccines simultaneously.
- Update the **risk assessment and the estimate of the susceptible population**, taking into account changes in ecological factors, migration, vaccination coverage, socioeconomic activities, as well as the risk of urbanization, to guide vaccination and control measures.
- Vaccination of the population in at-risk areas, reaching **at least 95% coverage** in residents of these areas (urban, rural, and jungle), through different strategies:
  - At the intramural level, make rational use of the vaccine and avoid missed opportunities for vaccination.
  - Extramurally, when yellow fever vaccine is more widely available, countries should conduct **catch-up campaigns**, identifying unvaccinated populations, occupational and professional risk groups, and age groups with suboptimal coverage.
- Ensure vaccination of all travelers to endemic areas at least **10 days prior to travel**.
- **To have a reserve inventory in the country** to maintain routine vaccination and to respond in a timely manner in case of outbreaks.

Recommendations for international travelers on yellow fever vaccination are available in the **International Travel and Health document**, which is available from: <https://www.who.int/publications/i/item/9789241580472> (15).

Guidance for laboratory diagnosis in the Americas Region is published in the **Laboratory Diagnosis of Yellow Fever Virus Infection** document dated 9 September 2018 (16).

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16. Pan American Health Organization. Laboratory diagnosis of yellow fever virus infection. Washington, D.C.: PAHO; 2018. Available from: <https://www.paho.org/en/documents/laboratory-diagnosis-yellow-fever-virus-infection>.

## Useful links

- World Health Organization. The fundamentals of yellow fever disease, surveillance and laboratory diagnosis. Geneva: WHO; 2024. Available from: <https://openwho.org/courses/yellow-fever-fundamentals>.
- World Health Organization. Investigation and management of a yellow fever outbreak. Geneva: WHO; 2024. Available from: <https://openwho.org/courses/yellow-fever-outbreak>.
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