Epidemiological Update Yellow fever in the Americas Region

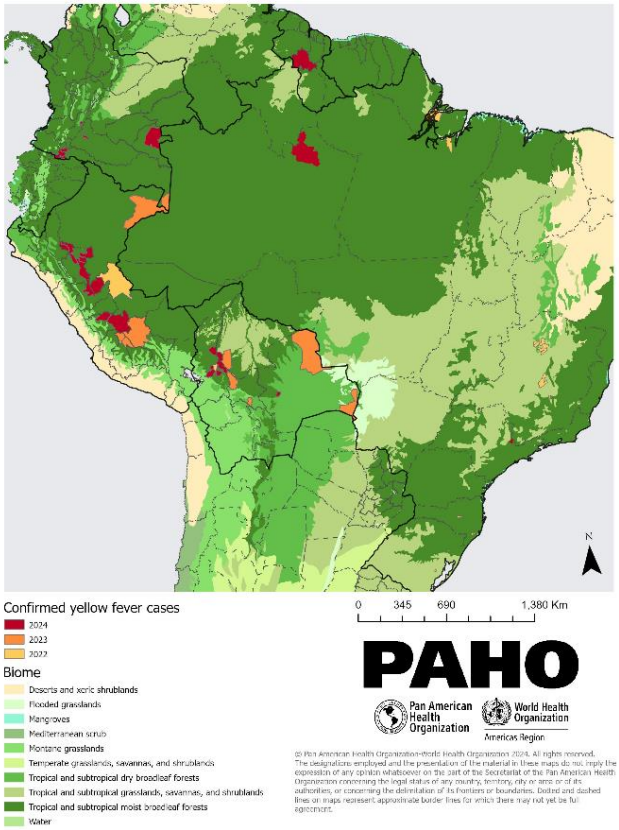
19 September 2024

Summary of the situation

Between epidemiological week (EW) 1 and EW 35 of 2024, 38 confirmed cases of yellow fever have been reported in the Americas Region, including 19 deaths. This represents five cases (three in the Plurinational State of Bolivia and two in Peru) and two deaths (in Peru) since the last Pan American Health Organization/World Health Organization (PAHO/WHO) epidemiological update published on 29 July 2024 *(1)*. The 38 cases were reported in five countries in the Region: Bolivia (seven cases, including three deaths), Brazil (three cases, including two deaths), Colombia (eight cases, including five deaths), Guyana (two cases), and Peru (18 cases, including nine deaths) *(2 - 9)*.

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

Figure 1. Geographical distribution of municipalities with occurrence of yellow fever cases in humans in Bolivia, Brazil, Colombia, Guyana, and Peru, years 2022, 2023, and 2024 (as of EW 35).



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

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In **Bolivia,** between EW 1 and EW 35 of 2024, seven cases of yellow fever had been confirmed (six by laboratory and one by clinical and epidemiological link), including three deaths. The cases correspond to six men and one woman, aged between 15 and 64 years, who initiated symptoms between April 20 and August 30 of 2024. Only four 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, among others. The cases were probably caused by exposure in the department of La Paz in the municipalities of Caranavi (n= 2 fatal cases), Guanay (n= 1 case), the municipality of San Buenaventura (n= 1 fatal case) and the municipality of Palos Blancos (n= 1 case); and in the department of Santa Cruz, municipality of Porongo (n= 2 cases). Since the previous update, three new cases have been confirmed: one in the municipality of Palos Blancos (La Paz) and two in the municipality of Porongo (Santa Cruz) *(2, 3)*.

In **Brazil**, between EW 1 and EW 35 of 2024, three confirmed cases of yellow fever, including two deaths, had 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 in Presidente Figueiredo, Amazonas state, with no history of vaccination against yellow fever, with onset of symptoms on 5 February 2024 and died on 10 February 2024. The second case is a 50-year-old male, with no history of vaccination against yellow fever, resident of Águas de Lindóia, São Paulo state, and with probable site of infection in Monte Sião, Minas Gerais state, with onset of symptoms on 23 March 2024 and died on 29 March. The third case corresponds to a 28-year-old male, with a history of vaccination against yellow fever in 2017, in the municipality of Serra Negra, São Paulo state, with onset of symptoms on 1 April 2024 and has recovered from the disease. All cases had a history of exposure to wild and/or forested areas, due to occupational activities and were laboratory confirmed by RT-PCR technique. During the monitoring period between July 2023 and June 2024, 1,790 events involving dead non-human primates (NHP) were reported. Of this total, 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 *(4, 5)*.

In **Colombia**, between EW 1 and EW 35 of 2024, eight confirmed cases of yellow fever had been reported, including five deaths; seven of the cases were identified through laboratory and histopathology surveillance for dengue, confirmed through real-time PCR analysis. Cases have been reported in five departments: in the department of Caquetá, municipality of El Doncello (n= 1 case); in the department of Huila, municipality of Campoalegre (n= 1 fatal case); in the department of Nariño, municipality of Ipiales (n= 1 case); in the department of Putumayo, municipalities of Orito (n= 1 fatal case), San Miguel (n= 1 fatal case), Valle del Guamuez (n= 1 fatal case) and Villagarzón (n= 1 fatal case); and in the department of Vaupés, municipality of Mitú (n= 1 case). The cases correspond to males aged between 18 and 66 years, with onset of symptoms between 3 January and 2 July 2024; all cases had history of exposure to wild or wooded areas, due to agricultural work activities. One case had a history of yellow fever vaccination *(6)*.

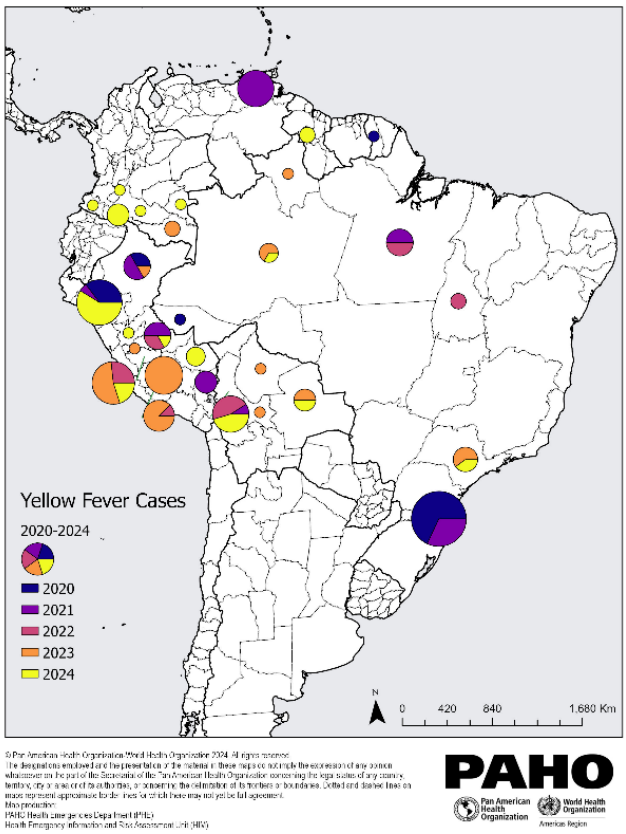
In **Guyana**, two laboratory-confirmed cases were identified during EW 11 of 2024. The first case was identified in Boa Vista, in the state of Roraima, Brazil, in a 17-year-old male, resident of the community of Massara, 100 km from Lethem, bordering Bonfim, Roraima, with no history of vaccination. The case worked in a rural area of Siparuni (forest region) extracting trees and had onset of symptoms on 29 February 2024. On 12 March, the RT-PCR test confirmed the identification of the sylvatic yellow fever virus by the Central Public Health Laboratory of Roraima. The second case was identified during the investigation and testing process following the identification of the index case. The case was a 21-year-old female, with no history of vaccination, residing in Siparuni, in the same logging camp as the first case. She

initiated symptoms on 13 March 2024, with a positive result for yellow fever by RT-PCR test on 16 March 2024. Both cases recovered and as of the date of publication of this update, no new cases had been reported *(7)*.

In **Peru**, between EW 1 and EW 35 of 2024, 18 cases of yellow fever had been confirmed, including nine deaths. Cases were confirmed in the departments of Huánuco, district of Mariano Damaso Beraún (n= 1 fatal case); department of Junín, districts of Pichanaqui (n= 2 cases) and Satipo (n= 1 fatal case); department of Madre de Dios, district of Tambopata (n= 3 cases); department of San Martin, districts of Alto Biavo (n= 1 fatal case), El Porvenir (n= 1 fatal case), Lamas (n= 1 fatal case), Moyobamba (n= 1 fatal case), Nueva Cajamarca (n= 1 case), Tabaloso (n= 1 fatal case), Pinto Recodo (n= 1 case), Shamboyacu (n= 1 case), Saposoa (n= 1 fatal case), and Shapaja (n= 1 fatal case); and in the department of Ucayali, Padre Abad district (n= 1 case). Since the previous PAHO/WHO epidemiological update *(1)*, two new cases (Nueva Cajamarca and Tabaloso) and two new deaths (Tabaloso and Saposoa) have been confirmed. The 18 cases were all males between 18 and 83 years of age, with onset of symptoms between 11 January and 2 August 2024. All cases had a history of exposure to wild and/or wooded areas, due to agricultural work activities, and no history of vaccination against 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 2**).

Figure 2. Geographic distribution of human yellow fever cases in the Region of the Americas, January 2020 to September 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 is high. Although immunization is one of the most successful public health interventions to prevent this disease, most of the cases reported during 2024 do not have a history of yellow fever vaccination.

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

It is necessary that countries guarantee vaccination coverage greater than or equal to 95% in the populations of 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 and at the same time respond to possible outbreaks *(10)*.

Surveillance

It is recommended that Member States with risk areas 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 surveillance actions for epizootics in non-human primates, since the death of non-human primates can serve as an early warning to identify the circulation of yellow fever and indicate the need to intensify vaccination actions.

Clinical management

Yellow fever is a serious viral hemorrhagic disease that represents a challenge for the health professional. 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 at: https://www.who.int/es/publications/i/item/9789241580472 *(15)*.

Figure 3 below shows the map with the vaccination recommendations in the Region of the Americas, based on the geographic distribution of the event *(16)*.

Figure 3. Map of yellow fever vaccination recommendations by country in the Region of the Americas, between 2013 and 2023.

Source: Adapted from Pan American Health Organization. Yellow fever vaccination recommendations in the Americas (latest update). Washington, D.C.: PAHO; 2024 [cited 18 September 2024]. Available from: https://www.arcgis.com/apps/webappviewer/index.html?id=7f2ecf3d51c244ba8694c3bf725a7601&extent=-16710855.2911%2C-6561276.9067%2C3326653.0516%2C3320502.11%2C102100

Guidance for laboratory diagnosis in the Region of the Americas is published in the document **Laboratory diagnosis of Yellow Fever Virus infection** dated 9 September 2018 *(17)*.

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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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