

Situation summary in the Americas

Between January 2016 and 13 March 2018, seven countries and territories of the Region of the Americas reported confirmed cases of yellow fever: the Plurinational State of Bolivia, Brazil, Colombia, Ecuador, French Guiana, Peru, and Suriname. The number of human cases and epizootics collectively reported in this period in the Region of the Americas is the highest observed in decades.

Since the 16 February 2018 Epidemiological Update on Yellow Fever¹ published by the Pan American Health Organization / World Health Organization (PAHO/WHO), **Brazil** and **Peru** had reported new yellow fever cases; following is a summary of the situation in both countries.

In **Brazil**, between 1 July 2017 and 13 March 2018, there were 920 confirmed human cases of yellow fever, including 300 deaths; this figure is higher than what was reported for the same period of the previous year (610 confirmed cases including 196 deaths). In the last four weeks (20 February to 13 March) there were 375 confirmed cases, including 136 deaths. Comparing the epidemiological curve in both periods (2016/2017 and 2017/2018) the highest incidence rate is during epidemiological week (EW) 3 of both years. In the 2017/2018 period, a second peak is observed in EW 7, likely related to the carnival holiday period which brought a greater internal movement of persons to areas with ongoing sylvatic transmission (**Figure 1**).

With respect to the probable sites of infection of the confirmed cases, in decreasing order they are the states of Minas Gerais (415 cases, including 130 deaths), São Paulo (376 cases, including 120 deaths), Rio de Janeiro (123 cases, including 49 deaths), Espírito Santo (5 cases, no deaths), and in the Federal District (1 fatal case).

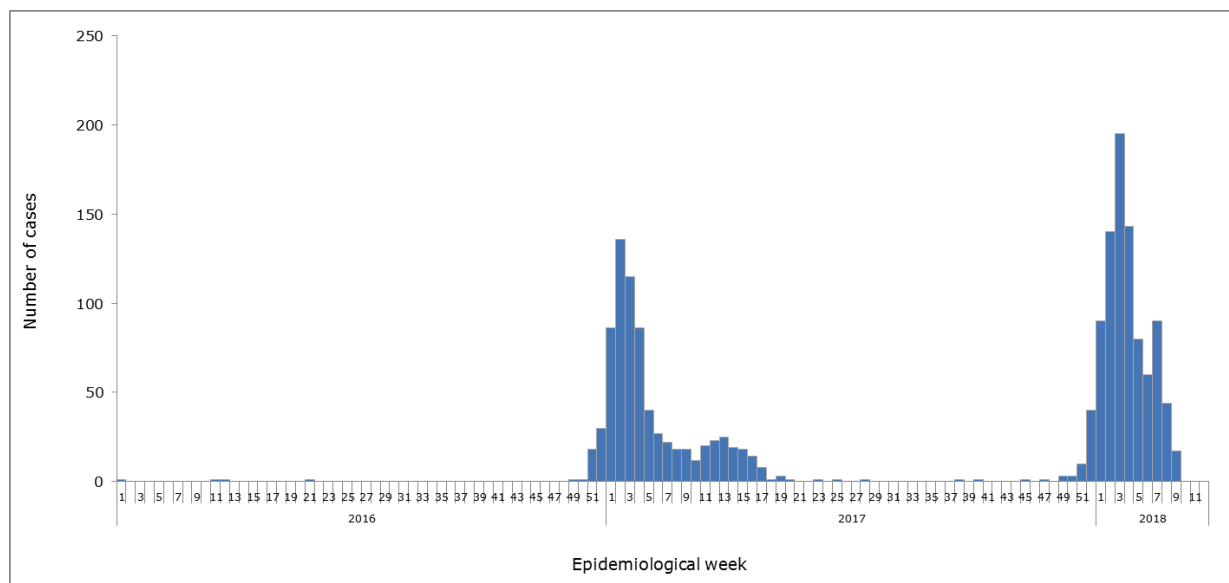
The significant increase in cases in the 2017/2018 seasonal period (July to May) is observed mainly in the states of Sao Paulo and Rio de Janeiro, where cases were recorded in areas near large cities and with high population density. The number of municipalities reporting confirmed human cases in the 2017/2018 season is higher (169) than in the previous period (118). In addition, the population residing in these municipalities in the 2017/2018 period is greater than the population of the 118 municipalities affected in the previous period (32 million vs. 8.9 million).

¹ Pan American Health Organization / World Health Organization. Epidemiological Update: Yellow Fever. 20 March 2018, Washington, D.C.: PAHO/WHO; 2018. Available at: <http://bit.ly/2BympPo>

In addition, since the last Epidemiological Update on yellow fever¹, the number of confirmed cases in unvaccinated international travelers has increased to a total of 11. Based on their country of residence, they are from: France (1 case) and the Netherlands (1 case) (both with history of stay in municipalities of Brazil considered at risk for yellow fever and with evidence of circulation of the virus there previously), and Argentina (4 cases), Chile (3 cases), Romania (1 case), and Switzerland (1 case). The latter cases reported stays in Ilha Grande in the municipality of Angra do Reis in Rio de Janeiro state (9 cases), Maripaora and Atibaia municipalities in São Paulo state (1 case), and Brumadinho municipality in Minas Gerais state (1 case).

To date, there is no evidence that *Aedes aegypti* is implicated in the transmission. However, the Brazil Ministry of Health reported the detection of yellow fever virus in *Aedes albopictus* mosquitoes captured in rural areas of two municipalities, Ituêta and Alvarenga, of Minas Gerais state in 2017 through an investigation carried out by the Evandro Chagas Institute. The significance of these findings requires further investigation particularly to confirm vector capacity for transmission.²

Figure 1. Distribution of confirmed human yellow fever cases by epidemiological week (EW). Brazil, 2016 – 2018



Source: Data published by the Ministry of Health of Brazil and reproduced by PAHO/WHO

With respect to epizootics in Brazil, between 1 July 2017 and 13 March of 2018, a total of 4,847 epizootics were reported, of which 617 were yellow fever confirmed. Epizootics are occurring in areas very close to large cities such as São Paulo and Rio de Janeiro.

² Brazil Ministry of Health press release, available at: <http://bit.ly/2o9yNx4>

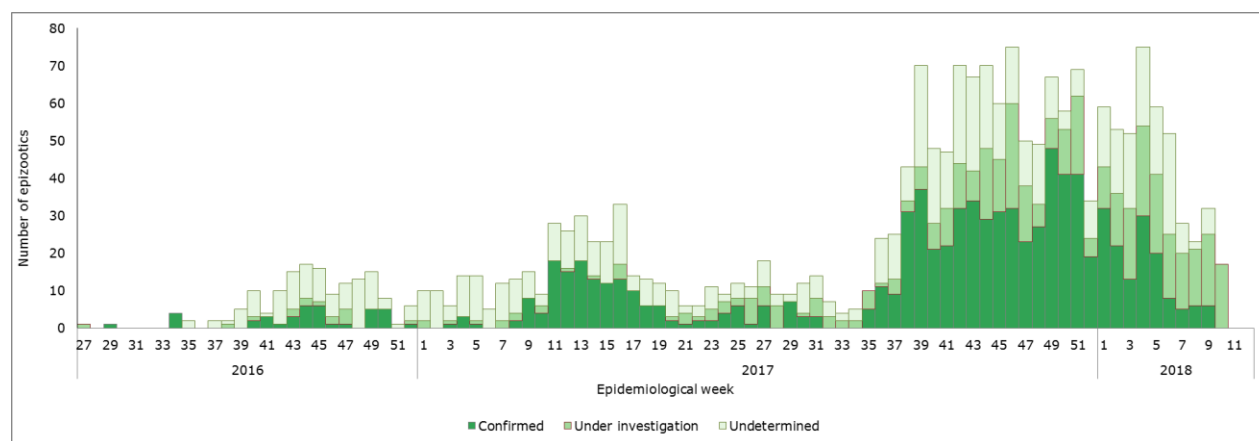
The state with the highest number of confirmed epizootics is São Paulo (**Figure 2**). Epizootics were also confirmed in the states of Espírito Santo, Mato Grosso, Minas Gerais, Rio de Janeiro, and Tocantins.

The map (**Figure 3**) shows the epizootic wave moving towards the southwest of the state of São Paulo. If the epizootic wave repeats the same pattern observed a decade ago—the epizootic wave affected southeastern and southern Brazil and subsequently reached Argentina and Paraguay—this current epizootic wave could reach the neighboring countries again. However, the change of temperature expected during the fall season might hinder the speed of the geographic spread between now and June.

In the second map (**Figure 4**) a comparison of municipalities with confirmed yellow fever epizootics in the 2016/2017 period and those of the 2017/2018 period is shown. In this last period the epizootics occurred in 27 federal entities, including municipalities that previously were not considered at risk for yellow fever. This is evidence of the continuous spread of epizootics which were found progressing 2.6 kilometers per day in some areas of the state of Sao Paulo during the last quarter of 2017.

As part of the response to the outbreak, federal and state authorities are conducting mass vaccination campaigns to immunize susceptible populations in 77 selected municipalities in the state of Rio de Janeiro (15 municipalities), São Paulo (54 municipalities), and Bahia (8 municipalities). As of EW 10 of 2018, preliminary results of the mass yellow fever vaccination campaign carried out, indicate that 8.8 million persons in São Paulo, 6.9 million persons in Rio de Janeiro, and 1.8 million persons in Bahia, representing a vaccination coverage rate of 94.97%, 68.52%, and 54.37% per respective state.³

Figure 2. Distribution of epizootics reported per EW. São Paulo, Brazil. EW 26 of 2016 to EW 10 of 2018.



Source: Data published by the São Paulo State Health Secretary, Brazil, and reproduced by PAHO/WHO

³ This data includes 11.3 million persons vaccinated in the three states, prior to the massive vaccination campaign that was started on 25 January of 2018 in São Paulo and Rio de Janeiro, and on 19 February of 2018 in Bahia.

Figure 3. Confirmed human cases and municipalities with confirmed yellow fever epizootics. Brazil, 17 January 2018, 22 February 2018, and 13 March 2018.

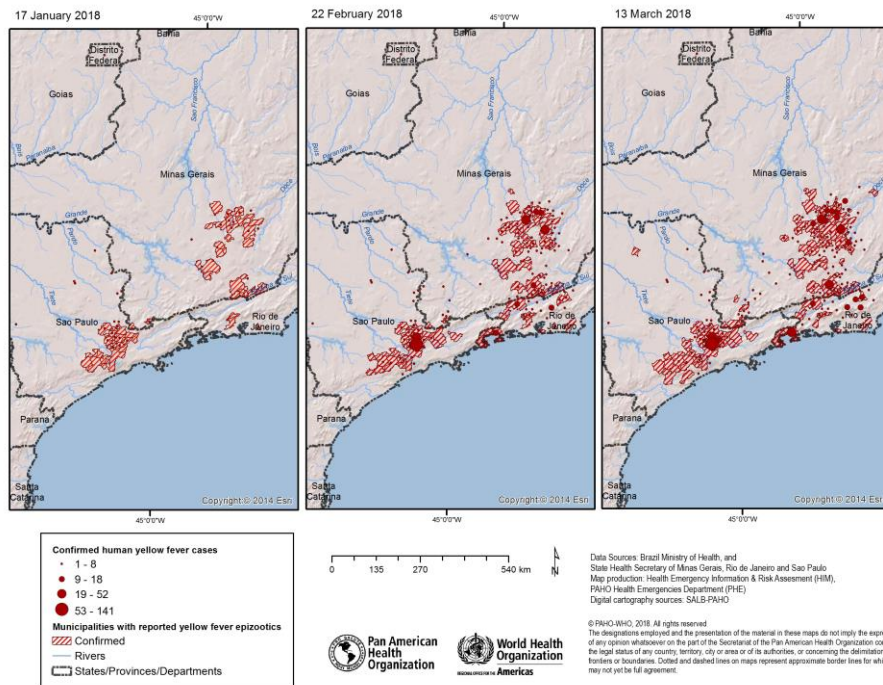
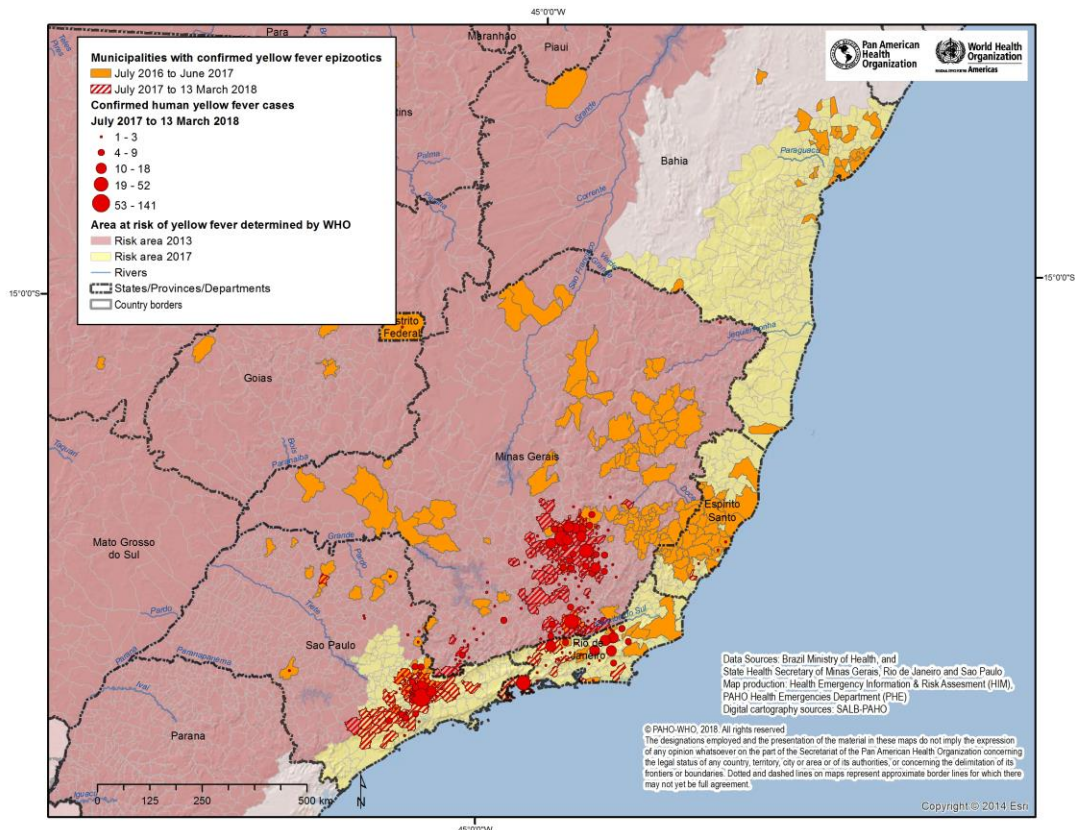


Figure 4. Municipalities with confirmed yellow fever epizootics, 2016/2017 and 2017/2018, and risk areas 2013 and 2017. Brazil.



In **Peru**, between EW 1 and 9 of 2018, 22 cases of yellow fever were reported, 8 of which were confirmed by laboratory and the remaining 14 are under investigation. This figure is higher than those reported in the same period of 2017, when there were 5 yellow fever cases reported (2 in Amazonas and 3 in Ayacucho).

In 2018, the majority of the cases are residents of the Calleria district, Coronel Portillo Province, Ucayali department, an area considered at-risk for yellow fever.

Advice for national authorities

The occurrence of confirmed cases of yellow fever in unvaccinated travelers highlights the need for Member States to reinforce the dissemination of recommendations for international travelers.

The continuing occurrence of epizootics during the current seasonal period indicates that the risk of transmission to unvaccinated humans continues; accordingly PAHO/WHO encourages Member States to continue efforts to immunize the at-risk populations and take the necessary actions to keep travelers informed and vaccinated, when heading to areas where yellow fever vaccination is recommended.

On 16 January 2018, the WHO published updated advice, titled, "Updates on yellow fever vaccination recommendations for international travelers related to the current situation in Brazil, information for international travelers," available at: <http://www.who.int/ith/updates/20180116/en/>

Vaccination

The yellow fever vaccine is safe and affordable and provides effective immunity against the disease in the range of 80 to 100% of those vaccinated after 10 days and 99% immunity after 30 days. A single dose provides life-long protection against yellow fever disease. A booster dose of yellow fever vaccine is not needed.

Given the limitations on the availability of vaccines and with the aim of promoting the rational use, PAHO/WHO reiterates its recommendations to national authorities:

1. Conduct an assessment of vaccination coverage against yellow fever in areas at risk at the municipal level to guarantee at least 95% coverage⁴ among the resident population of these areas.
2. Member States that are not currently experiencing outbreaks should not conduct yellow fever immunization campaigns. Priority should be given to the use of vaccines in susceptible populations and to avoid revaccination.
3. Ensure vaccination of all travelers to endemic areas at least 10 days before traveling.

⁴ Pan American Health Organization. Regional immunization action plan. 54th Directing Council of PAHO, 67th session of the WHO Regional Committee for the Americas; 28 September – 1 October 2015; Washington (DC), United States. Washington (DC): PAHO; 2015. Available at: http://www2.paho.org/hq/index.php?option=com_content&view=article&id=13101&Itemid=42296&lang=en

4. Depending on vaccine availabilities, Member States should have a small stock that allows them to respond to outbreaks.
5. Postpone routine vaccination in children in non-endemic areas until sufficient vaccines are available. Once there is availability, catch-up campaigns should be conducted to complete vaccination schedules.

Precautions

It is recommended to individually assess the epidemiological risk of contracting disease when faced with the risk of an adverse event occurring in persons over 60 years who have not been previously vaccinated.

- The vaccine can be offered to individuals with asymptomatic HIV infection with CD4+ counts ≥ 200 cells / mm³ requiring vaccination.
- Pregnant women should be vaccinated in emergency epidemiological situations and following the explicit recommendations of health authorities.
- Vaccination is recommended in nursing women who live in endemic areas, since the potential risk of transmitting the vaccine virus to the child is far lower than the benefits of breastfeeding.
- For pregnant or lactating women traveling to areas with yellow fever transmission, vaccination is recommended when travel cannot be postponed or avoided. They should receive advice on the potential benefits and risks of vaccination to make an informed decision. The benefits of breastfeeding are superior to those of other nutritional alternatives.

The following people are usually excluded from yellow fever vaccination:

- Immunocompromised individuals (including those with thymus disorders, symptomatic HIV, malignant neoplasms under treatment, and those that are receiving or have received immunosuppressive or immunomodulatory treatments, recent transplants, and current or recent radiation therapy).
- People with severe allergies to eggs and their derivatives.

Related Links

- Brazil Ministry of Health. Yellow Fever Reports. Available at: <http://bit.ly/2sq3aV6>
- PAHO/WHO Yellow Fever. Available at: http://www.paho.org/hq/index.php?option=com_topics&view=rdmore&cid=5514&Itemid=40784&lang=en
- PAHO/WHO. Guidance on Laboratory Diagnosis of Yellow Fever Virus Infection. Available at: http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=270&gid=38104&lang=en
- PAHO/WHO. Requirements for the International Certificate of Vaccination or Prophylaxis (ICVP) with proof of vaccination against yellow fever. Available at: http://www.paho.org/hq/index.php?option=com_topics&view=article&id=69&Itemid=40784&lang=en
- PAHO Health Emergencies Interactive Atlas and Maps. Available at: http://www.paho.org/hq/index.php?option=com_content&view=article&id=13224%3A-interactive-atlas-and-maps&catid=3889%3Aaero-contents&Itemid=42337&lang=en