

## Situation summary in the Americas

Since epidemiological week (EW) 1 to EW 9 of 2017, **Brazil, Colombia, Ecuador, Peru, the Plurinational State of Bolivia,** and **Suriname** have reported suspected and confirmed yellow fever cases.

Following is a summary of the situation in Brazil, Ecuador, Peru, the Plurinational State of Bolivia, and Suriname.

In **Brazil**, since the beginning of the outbreak in December 2016 to 13 March of 2017, there were 1,538 cases of yellow fever reported (396 confirmed, 184 discarded, and 958 suspected cases remain under investigation), including 255 deaths (134 confirmed, 9 discarded, and 112 under investigation). The case fatality rate (CFR) is 34% among confirmed cases and 12% among suspected cases.

According to the probable site of infection, 79% of the suspected and confirmed cases were reported in the state of Minas Gerais (1,070), followed by Espírito Santo (245), São Paulo (15), Bahia (9), Tocantins (6), Goiás (3), and Rio Grande do Norte (1).<sup>1</sup> The confirmed cases are distributed in three states: Minas Gerais (303), Espírito Santo (89), and São Paulo (4). **Figure 1** illustrates the municipalities with confirmed cases and cases under investigation, as well as confirmed epizootics, and epizootics under investigation.

In the state of Minas Gerais, the downward trend in suspected and confirmed cases continues to decline for the fifth consecutive week. In the state of Espírito Santo there has been a downward trend in cases as of EW 5 of 2017; it will be necessary to continue to observe the evolution of the epidemic.

**Figure 2** illustrates the trend of confirmed yellow fever cases by probable place of infection.

With regard to the number of new cases (confirmed and under investigation) reported between 13 February and 13 March, there were 125 new cases in Espírito Santo and in Minas Gerais during the same period there were 108 new cases reported. **Figure 3** illustrates the distribution of confirmed, suspected and discarded cases in the state of Espírito Santo.

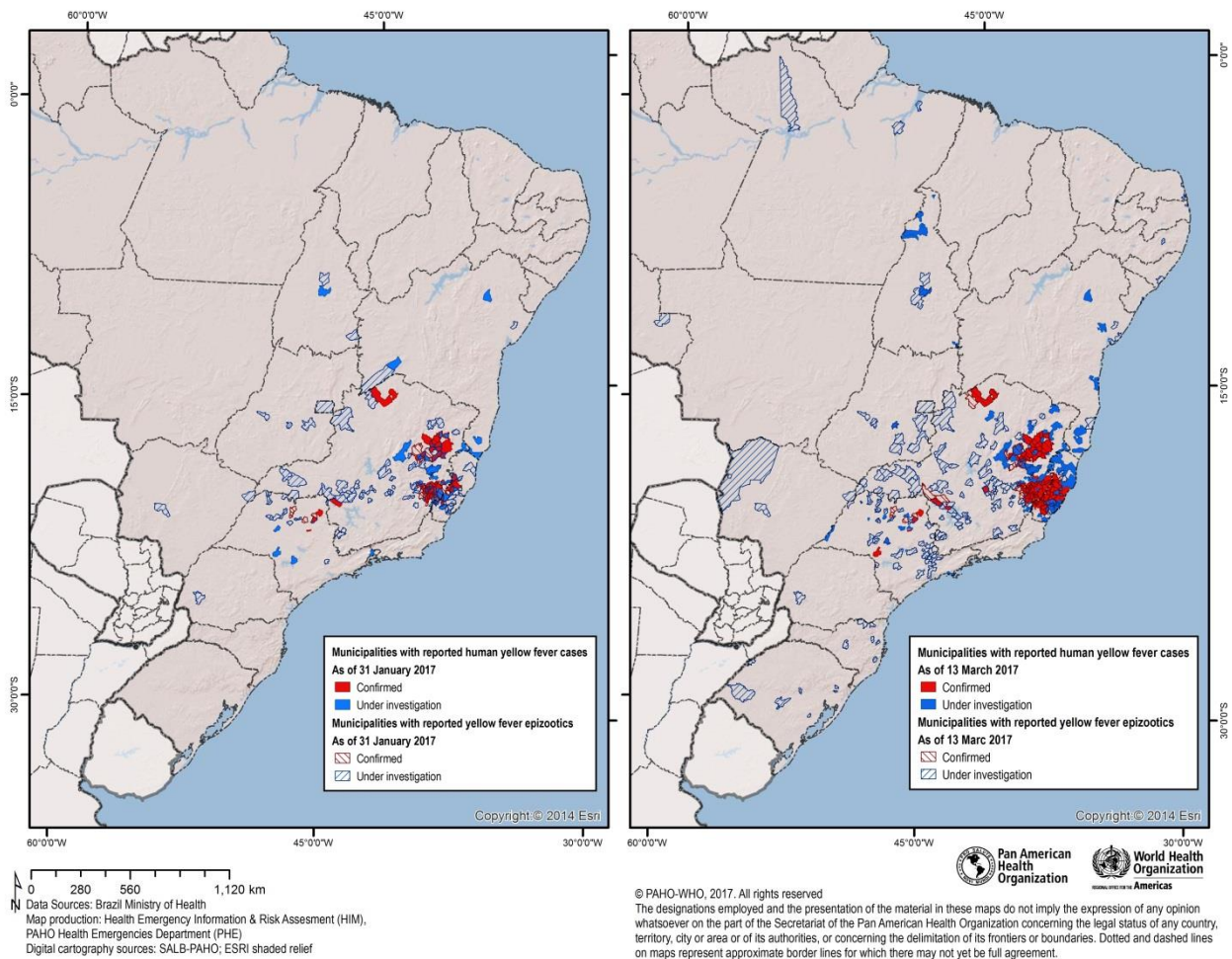
---

<sup>1</sup> There are also 29 discarded cases that were reported by other Federal Units.

There is possibility of a change in the yellow fever transmission cycle in this current outbreak, however, to date *Aedes aegypti* has not been reported to have a role in transmission. Confirmed cases have been reported in municipalities near large urban areas in the states of Espírito Santo and Minas Gerais; this combined with the confirmation of epizootics and notification of suspected cases in the municipality of Vitoria, Espírito Santo, represent a high risk for a change in the transmission cycle.

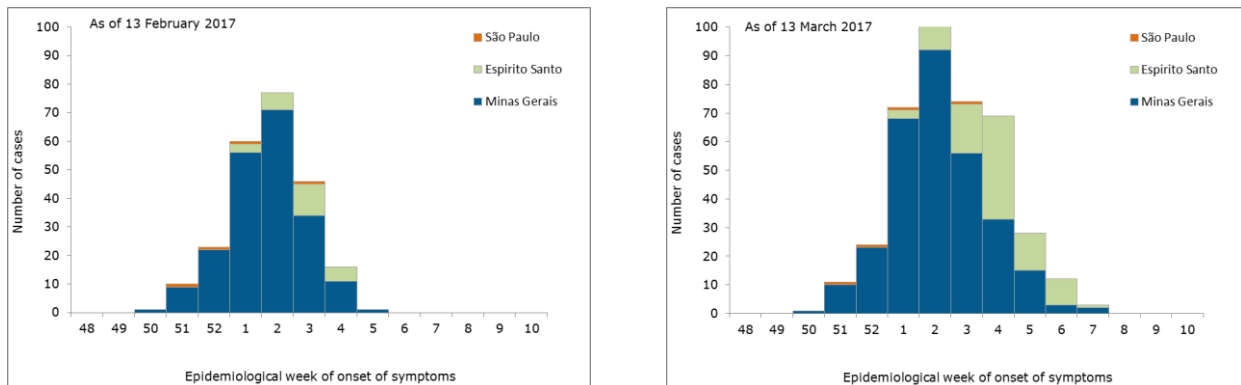
With regard to the confirmed fatal cases and their probable site of infection, 111 were in the state of Minas Gerais, 3 in the state of São Paulo and 20 in the state of Espírito Santo. In decreasing order, the CFR among suspected and confirmed cases by state is 75% in São Paulo, 37% in Minas Gerais, and 22% in Espírito Santo.

**Figure 1.** Geographic distribution of reported human yellow fever cases and yellow fever epizootics, Brazil, 31 January to 13 March 2017



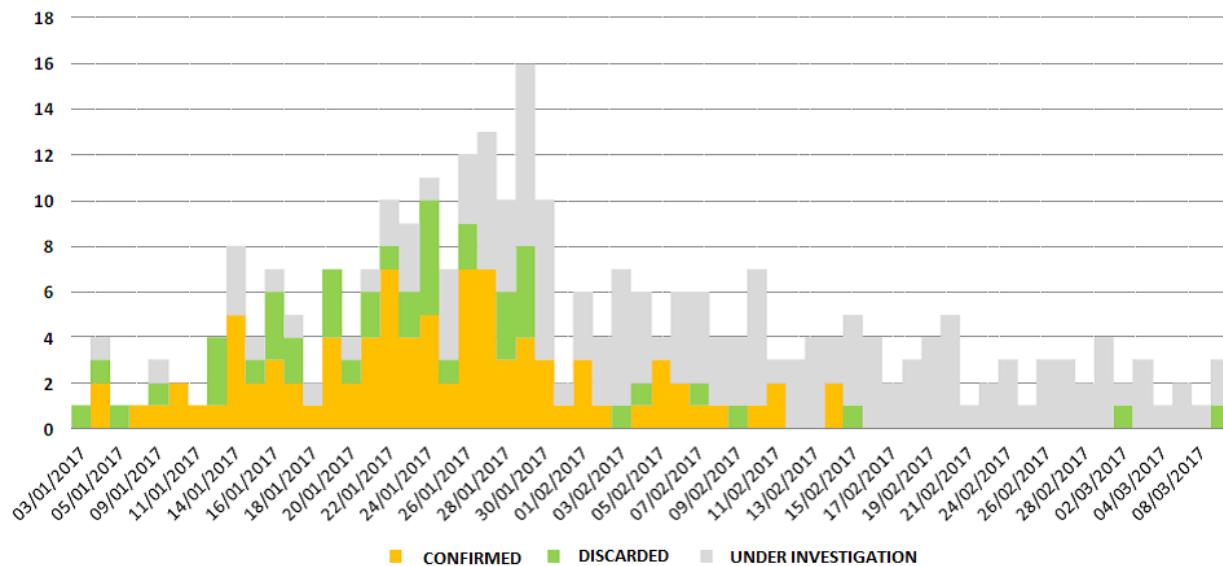
**Source:** Data published by Brazil Ministry of Health (Monitoring of yellow fever cases and deaths) compiled and reproduced by PAHO/WHO

**Figure 2.** Distribution of confirmed yellow fever cases by place of occurrence and epidemiological week of onset of symptoms. Brazil, 13 February and 13 March 2017



**Source:** Data published by Brazil Ministry of Health (Monitoring of yellow fever cases and deaths) compiled and reproduced by PAHO/WHO

**Figure 3.** Distribution of yellow fever cases by date of onset of symptoms and classification, Espírito Santo, 3 January to 8 March of 2017



**Source:** Data provided to PAHO/WHO by the Espírito Santo State Secretariat of Health and reproduced by PAHO/WHO

Since the last yellow fever Epidemiological Update<sup>2</sup> up to 13 March 2017, 260 new epizootics were reported in nonhuman primates (NHP) and are under investigation. No new epizootics have been confirmed during this period. Since the beginning of the outbreak, a total of 1,228

<sup>2</sup> PAHO/WHO Epidemiological Update: Yellow Fever. 9 March 2017. Available at: [http://www.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&Itemid=270&gid=38561&lang=en](http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=38561&lang=en)

NHP epizootics were reported, of which 386 were yellow fever confirmed and 11 were discarded.

Epizootics in NHP were reported in the Federal District and in the states of Alagoas, Bahia, Goiás, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Rio Grande do Norte, Rio Grande do Sul, Rondônia, Santa Catarina, São Paulo, Sergipe, and Tocantins.

Reports of epizootics are currently under investigation in the states of Mato Grosso do Sul (bordering Bolivia and Paraguay), Santa Catarina (bordering Argentina), Rio Grande do Sul (bordering Uruguay and Argentina), Rondônia (bordering Bolivia), Pará (bordering Guyana and Suriname), and Paraná (bordering Argentina and Paraguay), this represents a risk of spread of the virus to the bordering countries, especially in areas with similar ecosystems.

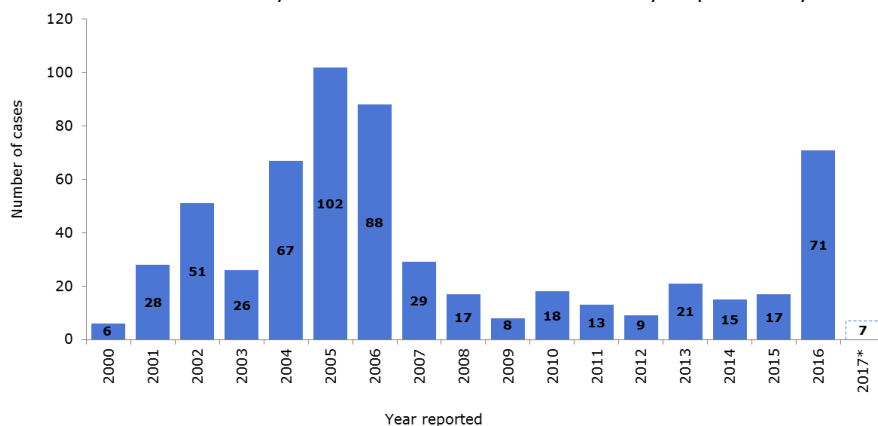
In **Ecuador**, in EW 10 of 2017 the IHR National Focal Point of Ecuador reported a confirmed case of yellow fever to PAHO/WHO; the case is a 31-year-old male patient in the province of Sucumbios, which borders Colombia. The case was confirmed by the National reference Laboratory by real-time polymerase chain reaction (RT-PCR).

Prior to this case, the last confirmed yellow fever case in Ecuador was reported in 2012 in the province of Napo.

In **Peru**, up to EW 9 of 2017, a total of 7 confirmed and probable cases of yellow fever had been reported, including two deaths. The Ayacucho department reported three confirmed cases of yellow fever in the Sivia and Santa Rosa districts, including one death in the Santa Rosa district. The remaining four cases were reported as probable cases by the departments of Amazonas (2), Pasco (1), and San Martín (1).<sup>3,4</sup>

**Figure 4** illustrates the number of probable and confirmed yellow fever cases reported between 2000 and 2017 in Peru.

**Figure 4.** Probable and confirmed yellow fever cases in Peru by reported year, 2000-2017



\*Up to EW 9 of 2017

<sup>3</sup> Peru Ministry of Health, National Center for Epidemiology, Prevention and Control of Diseases: Situational Room for Health Situation Analysis, EW 9 of 2017: Yellow fever. Available at:

[http://www.dge.gob.pe/portal/index.php?option=com\\_content&view=article&id=14&Itemid=121](http://www.dge.gob.pe/portal/index.php?option=com_content&view=article&id=14&Itemid=121)

<sup>4</sup> Peru Ministry of Health, National Center for Epidemiology, Prevention and Control of Diseases: Epidemiological Bulletin of Peru, EW 8 of 2017. Available at:

<http://www.dge.gob.pe/portal/docs/vigilancia/boletines/2017/08.pdf>

**Source:** Data published by the Peru Ministry of Health, National Center for Epidemiology, Prevention and Control of Diseases and reproduced by PAHO/WHO

In the **Plurinational State of Bolivia**, in EW 6 of 2017 the IHR National Focal Point of Bolivia reported a case of yellow fever with a positive IgM by ELISA technique result to PAHO/WHO. The case is a 28-year-old, unvaccinated male tourist who arrived in Bolivia on 8 January 2017 and went to the municipality of Caranavi on 9 January, where he likely acquired the infection.

Yellow fever in Bolivia is endemic and has occurred cyclically with outbreaks of varying magnitudes up to 2012. As of 2013, only isolated cases have been reported.

In **Suriname**, in EW 10 of 2017 a laboratory confirmed case of yellow fever was reported in a traveler from the Netherlands who had not been vaccinated for yellow fever and had remained in Suriname from mid-February to early-March 2017.<sup>5</sup> The case was confirmed by the Erasmus Medical Center in Rotterdam via RT-PCR and sequencing, as well as by RT-PCR by the Bernhard Nocht Institute in Hamburg, Germany.

Suriname had not reported yellow fever cases since 1972.

## Recommendations

Given the current yellow fever situation in Brazil and the emergence of cases in areas where cases have not been detected in several years, the Pan American Health Organization, Regional Office of the World Health Organization (PAHO/WHO) urges Member States to continue efforts to detect, confirm, and adequately and timely treat cases of yellow fever. To this end, health care workers should be kept up-to-date and trained to detect and treat cases especially in areas of known virus circulation.

PAHO/WHO encourages Member States to take the necessary actions to keep travelers, heading to areas where yellow fever vaccination is mandatory, informed and vaccinated.

---

<sup>5</sup> The information was reported by the Netherlands IHR National Focal Point.

## Related Links

- PAHO/WHO Yellow Fever. Available at:  
[http://www.paho.org/hq/index.php?option=com\\_topics&view=rdmore&cid=5514&Itemid=40784&lang=en](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, February 2017, Available at:  
[http://www.paho.org/hq/index.php?option=com\\_docman&task=doc\\_download&Itemid=270&gid=38104&lang=en](http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=270&gid=38104&lang=en)
- Brazil Ministry of Health, Situation report on the yellow fever outbreak. Available at:  
<http://portalsaude.saude.gov.br/index.php/o-ministerio/principal/leia-mais-o-ministerio/619-secretaria-svs/11-svs/27300-febre-amarela-informacao-e-orientacao>.
- 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](http://www.paho.org/hq/index.php?option=com_topics&view=article&id=69&Itemid=40784&lang=en)

## References

1. Yellow fever reports. Brazil Ministry of Health. Available at:  
<http://portalsaude.saude.gov.br/index.php/o-ministerio/principal/leia-mais-o-ministerio/619-secretaria-svs/11-svs/27300-febre-amarela-informacao-e-orientacao>
2. Peru Ministry of Health- MINSA, National Center for Epidemiology, Prevention and Control of Diseases, Epidemiological Bulletin of Peru, EW 8 of 2017. Available at:  
<http://www.dge.gob.pe/portal/docs/vigilancia/boletines/2017/08.pdf>
3. Peru Ministry of Health – MINSA, National Center for Epidemiology, Prevention and Control of Diseases; Situational Room for Health Situation Analysis – EW 9 of 2017: Yellow Fever. Available at:  
[http://www.dge.gob.pe/portal/index.php?option=com\\_content&view=article&id=14&Itemid=121](http://www.dge.gob.pe/portal/index.php?option=com_content&view=article&id=14&Itemid=121)
4. Epidemiological Bulletin EW 9. Colombia National Institute of Health. 2017. Available at:  
<http://www.ins.gov.co/boletin-epidemiologico/Paginas/default.aspx>
5. PAHO/WHO. Control of Yellow Fever. Field Guide. 2005. Scientific and Technical Publication No. 603. Available at:  
[http://www.paho.org/hq/index.php?option=com\\_docman&task=doc\\_download&Itemid=270&gid=20159&lang=en](http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=270&gid=20159&lang=en)