

Situation summary in the Americas

Since epidemiological week (EW) 1 to EW 11 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 and Peru.

In **Brazil**, since the beginning of the outbreak in December 2016 to 17 March of 2017, there were 1,561 cases of yellow fever reported, of which 28.7% were laboratory-confirmed (n=448), 16.9% were discarded (n=263), and 54.8% (n=850) remain under investigation as suspected cases, including 264 deaths (144 confirmed, 10 discarded, and 110 under investigation). The case fatality rate (CFR) is 32% among confirmed cases.

According to the probable site of infection, the cases were reported in 188 municipalities, of which 49.4% are in the state of Minas Gerais. This state, furthermore, accounts for the majority of suspected and confirmed cases (1,016), followed by Espírito Santo (243), São Paulo (15), Bahia (8), Tocantins (6), Goiás (3), and Rio de Janeiro (3).¹ The confirmed cases are distributed in four states: Minas Gerais (349), Espírito Santo (93), São Paulo (4), and Rio de Janeiro (2).

The cases reported in the state of Rio de Janeiro are three² men that reside in the rural area of the municipality of Casimiro de Abreu and have no history of travel to states with confirmed circulation of the yellow fever virus.

In the states of Minas Gerais and Espírito Santo, the downward trend in reported cases observed in the last five weeks continues (**Figures 1 and 2**). **Figure 1** illustrates the trend of reported cases in the four regional health units which account for 96% of the cases reported in Minas Gerais.

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

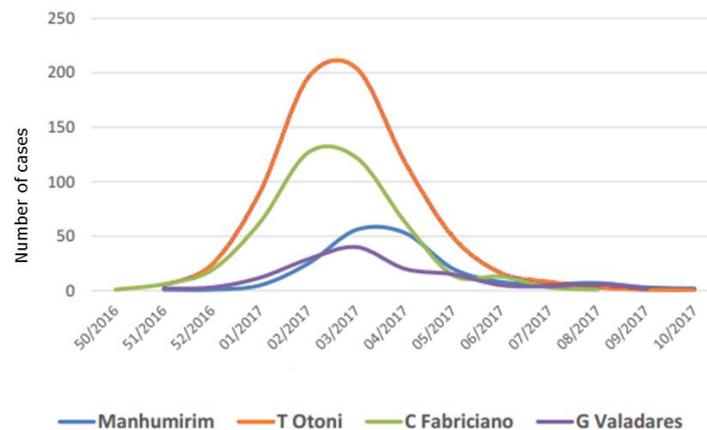
¹ There are also 29 discarded cases that were reported by other Federal Units.

² Information on the third case is available at: <http://www.casimirodeabreu.rj.gov.br/2017/03/21/nota-oficial-2/>

notification of suspected cases in the municipality of Vitoria, Espírito Santo, represent a high risk for a change in the transmission cycle.

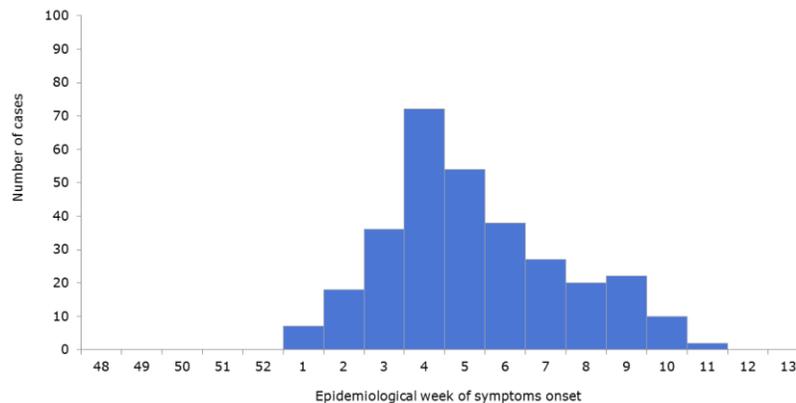
With regard to the confirmed fatal cases and their probable site of infection, 118 were in the state of Minas Gerais, 3 in the state of São Paulo, 22 in the state of Espírito Santo, and one in Rio de Janeiro. In decreasing order, the CFR among suspected and confirmed cases by state is 75% in São Paulo, 34% in Minas Gerais, 33% in Rio de Janeiro, and 24% in Espírito Santo.

Figure 1. Distribution of reported yellow fever cases by epidemiological week of symptoms onset and regional health unit of infection. Minas Gerais, EW 1 to EW 10 of 2017



Source: Data published by the Minas Gerais State Secretariat of Health and reproduced by PAHO/WHO

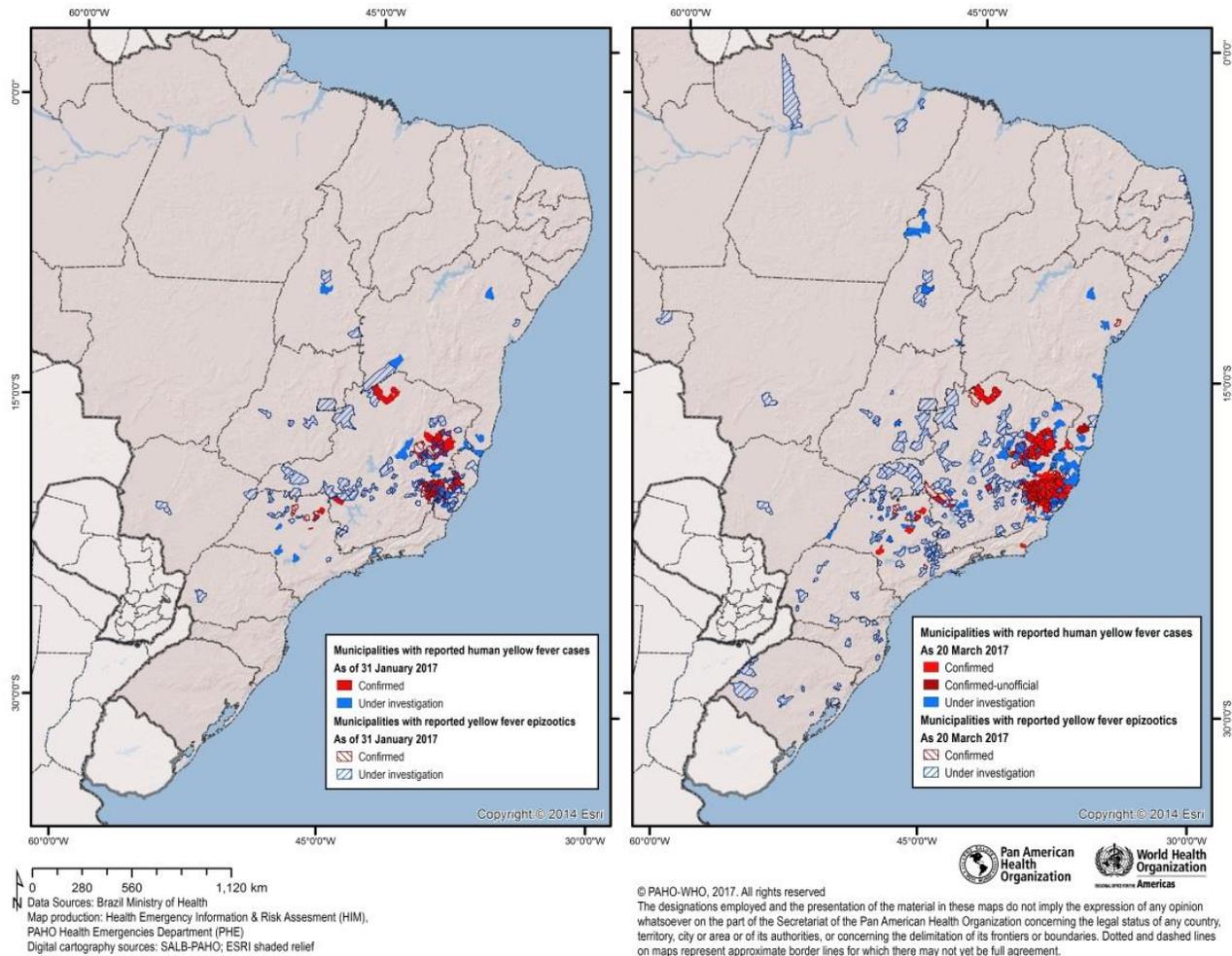
Figure 2. Distribution of reported yellow fever cases by epidemiological week of symptoms onset. Espírito Santo, EW 1 to EW 11 of 2017



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

Figure 3 illustrates the municipalities with confirmed cases and cases under investigation, as well as confirmed epizootics, and epizootics under investigation.

Figure 3. Geographic distribution of reported human yellow fever cases and yellow fever epizootics, Brazil, 31 January to 17 March 2017



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

The thematic maps presented in **Figure 3** incorporate in superimposed layers the following elements: in red, the municipalities where human cases have been confirmed, and in red hatched pattern (with red lines), the municipalities where epizootics have been confirmed. In the states of Minas Gerais and Espírito Santo, the overlap of the two layers can be observed.

On the other hand, in blue, the municipalities with suspected human cases under investigation, and in blue hatched pattern (with blue lines), epizootics under investigation. It is observed that the states of Alagoas, Mato Grosso do Sul, Para, Paraíba, Paraná, Pernambuco, Rio Grande do Sul, Rondônia, Santa Catarina, and Sergipe, have only reported epizootics under investigation and no human cases.

Since the last yellow fever Epidemiological Update³ up to 17 March 2017, 21 new epizootics were reported in nonhuman primates (NHP). Since the beginning of the outbreak up to 17 March 2017, a total of 1,249 NHP epizootics were reported, of which 389 were yellow fever confirmed, 382 remain under investigation, and 12 were discarded.

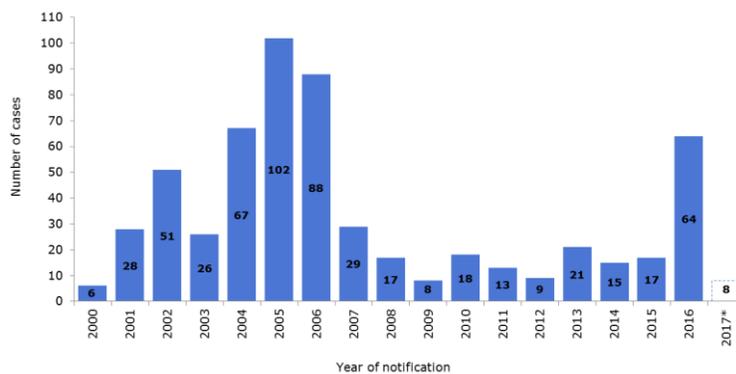
Epizootics in NHP were reported in the Federal District and in the states of Alagoas, Bahia, Goiás, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Rio Grande do Norte, Rio Grande do Sul, Rondônia, Santa Catarina, São Paulo, Sergipe, and Tocantins.

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 **Peru**, as of EW 10 of 2017, a total of 14 cases of yellow fever were reported, of which three were confirmed, 5 remain classified as probable, and 6 were discarded; including two deaths. The confirmed cases were reported by the department of Ayacucho and the 5 probable cases by the department of Amazonas (2), San Martín (1), Madre de Dios (1), and Pasco (1).

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

Figure 4. Probable and confirmed yellow fever cases in Peru by reported year, 2000-2007



*As of EW 10 of 2017

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

³ PAHO/WHO Epidemiological Update: Yellow Fever. 16 March 2017. Available at: http://www2.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=38672&lang=en

⁴ The observed difference between this Epidemiological Alert and the previous one in the total number of confirmed and probable cases in 2016 is due to adjustments made by the Peru Ministry of Health – MINSa, National Center for Epidemiology, Prevention and Control of Diseases.

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.

Vaccination

The most important yellow fever prevention measure is vaccination. Preventive vaccination can be carried out through systematic immunization in childhood or through unique mass campaigns to increase vaccination coverage in risk areas and also through vaccination of those traveling to at-risk areas.

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 is sufficient to confer immunity and protection for life, without the need for booster doses. Severe side effects are extremely rare.

Given the limitations on the availability of vaccines, it is recommended that national authorities conduct an assessment of vaccination coverage against yellow fever in risk areas in order to focus the distribution of vaccines. In addition, it is recommended to keep a stock of vaccines at a national level to respond to possible outbreaks.

The vaccine against yellow fever is contraindicated in:

- people with acute febrile illnesses, with a commitment to their general health;
- people with a history of hypersensitivity to hen's eggs and their derivatives;
- pregnant women, except in an emergency situation and following explicit recommendations of the health authorities;
- people severely immunocompromised by illness (e.g., cancer, Leukemia, AIDS, etc.) or by medicines;
- infants younger than 6 months (consult the vaccine laboratory leaflet);
- people of any age who have a disease related to the thymus.

Precautions:

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

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
- 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
- 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
- WHO. Updates on yellow fever vaccination recommendations for international travellers related to the current situation in Brazil. Available at:
<http://www.who.int/csr/don/20-march-2017-yellow-fever-brazil/en/#>

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2. Peru Ministry of Health – MINSA, National Center for Epidemiology, Prevention and Control of Diseases; Situational Room for Health Situation Analysis – EW 10 of 2017: Yellow Fever. Available at:
http://www.dge.gob.pe/portal/index.php?option=com_content&view=article&id=14&Itemid=121
3. Epidemiological Bulletin EW 10. Colombia National Institute of Health. 2017. Available at: <http://www.ins.gov.co/boletin-epidemiologico/Paginas/default.aspx>
4. 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