

Situation summary in the Americas

Since epidemiological week (EW) 1 to EW 14 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.

In **Brazil**, since the beginning of the outbreak in December 2016 up to 6 April 2017, there were 2,210 cases of yellow fever reported (604 confirmed, 1,054 discarded, and 552 suspected under investigation), including 302 deaths (202 confirmed, 52 discarded, and 48 under investigation). The case fatality rate (CFR) is 33% among confirmed cases.

According to the probable site of infection,¹ the cases were reported in 342 municipalities, while the confirmed cases were distributed among 103 municipalities in 5 states (Espírito Santo, Minas Gerais, Pará, Rio de Janeiro, and São Paulo).

With regard to the confirmed fatal cases and their probable site of infection, 148 were in Minas Gerais, four in São Paulo, 43 in Espírito Santo, four in Pará, and three in Rio de Janeiro. In descending order, the CFR among suspected and confirmed cases by state is 100% in Pará, 80% in São Paulo, 34% in Minas Gerais, 29% in Espírito Santo, and 27% in Rio de Janeiro.

In the state of Minas Gerais, the downward trend in reported cases persists. The date of symptoms onset of the last reported case is 6 March 2017. In the state of Espírito Santo, since EW 9 of 2017, a new increase has been observed in the number of cases, the majority of which are being reported from the southern part of the state. Local and state authorities are investigating and characterizing this increase in cases while also intensifying immunization activities. Similarly, in the state of Rio de Janeiro, an increase in the number of suspected cases was observed between 15 and 25 March; it will be necessary to observe if this trend is maintained in the following weeks (**Figure 1**).

Moreover, since EW 13, four autochthonous cases of yellow fever were confirmed in the state of Pará, in the municipalities of Alenquer (3) and Monte Alegre (1).²

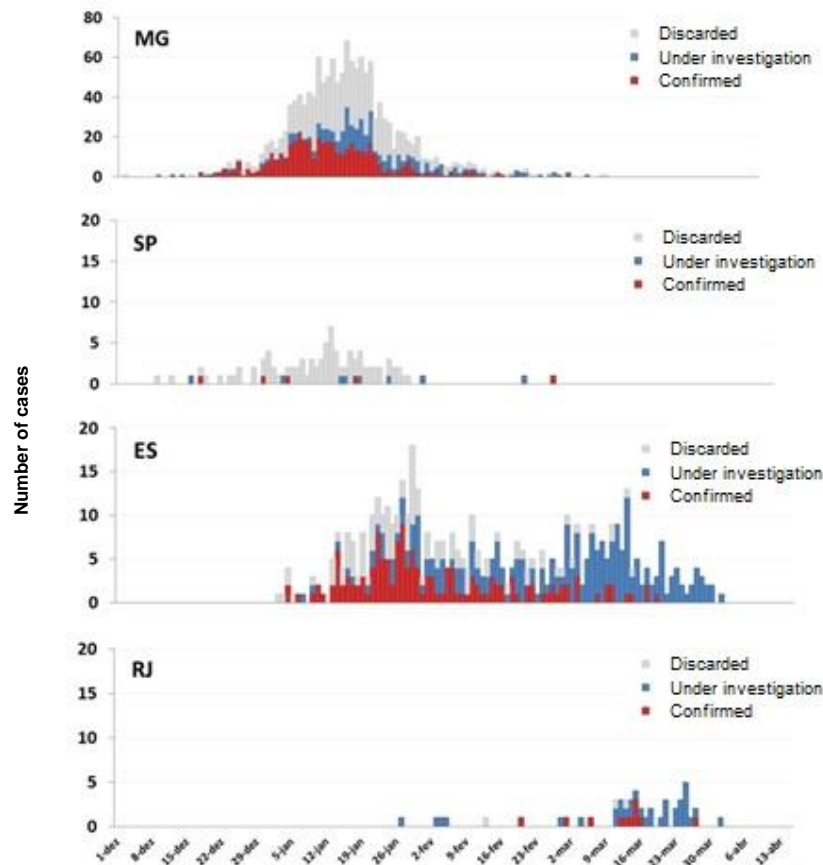
¹ There are also 41 discarded cases that were reported by other Federal Units.

² Information available at: <http://www.saude.pa.gov.br/?p=4997>

To date, *Aedes aegypti* has not been reported to have a role in transmission. However, confirmed epizootics in large cities, such as Vitoria in Espírito Santo³ and Salvador in Bahia,⁴ represent a high risk for a change in the transmission cycle.

A recent study conducted by researchers from Brazil⁵ reported that the genomic sequencing of samples obtained from two southern brown howler monkeys (*Alouatta guariba clamitans*) found in the state of Espírito Santo belong to the South American genotype I. This genotype has been the most frequently found in Brazil during previous outbreaks.

Figure 1. Distribution of reported yellow fever cases by date of symptoms onset and probable state of infection. Brazil, 1 December 2016 to 13 April 2017.



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

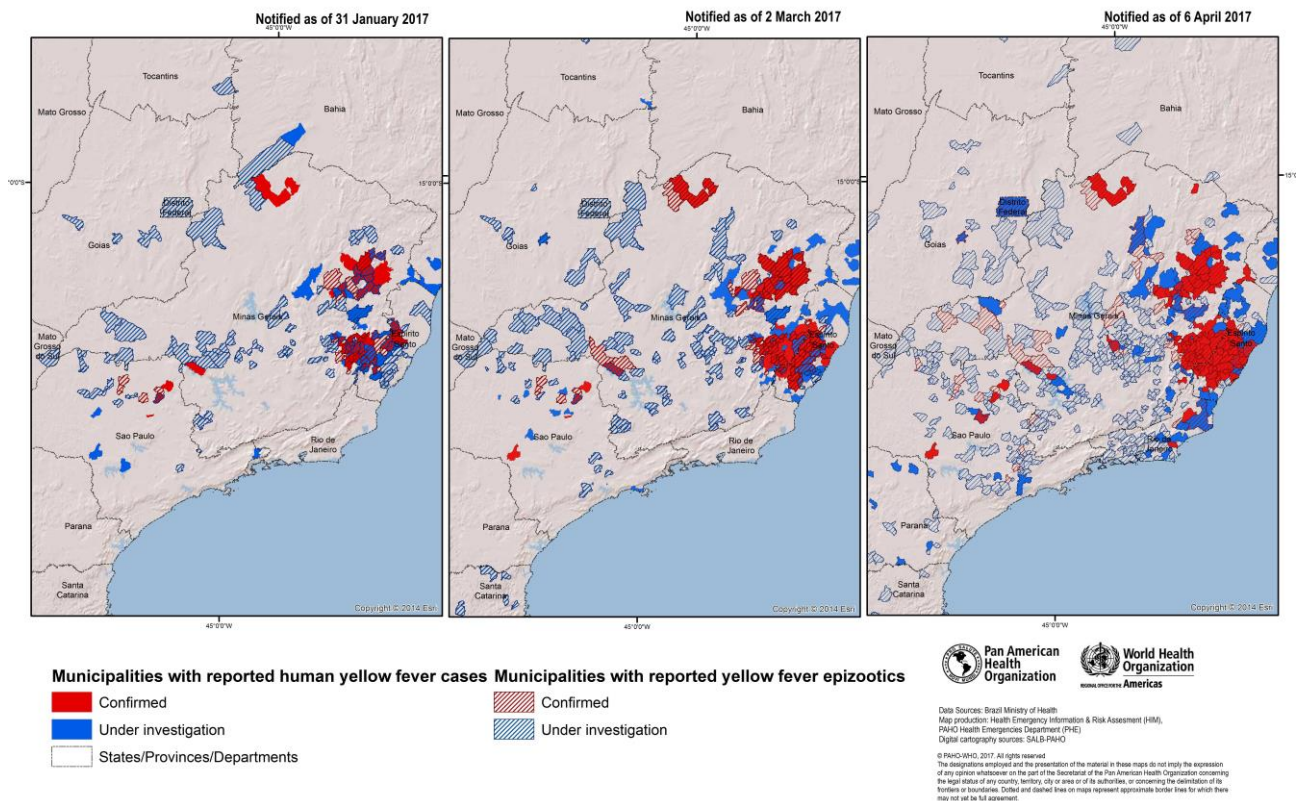
³ Municipalities with confirmed epizootics. Available at: <http://saude.es.gov.br/Not%C3%ADcia/febre-amarela-silvestre-94-notificacoes-descartadas>

⁴ Confirmation of yellow fever in four monkeys in the neighborhoods of Vila Laura, Paripe, and Itagira in Salvador. Available at: http://www.saude.ba.gov.br/novoportal/index.php?option=com_content&view=article&id=11761:-estado-intensifica-acoes-de-controle-do-virus-da-febre-amarela&catid=13:noticias&Itemid=25

⁵ Bonaldo MC, Gómez MM, dos Santos AAC, de Abreu FVS, Ferreira-de-Brito A, de Miranda RM, et al. Genome analysis of yellow fever virus of Brazil ongoing outbreak reveals polymorphisms [Submitted]. Mem Inst Oswaldo Cruz E-pub: 4 Apr 2017. doi: 10.1590/0074-02760170134.

Figure 2 illustrates the municipalities with confirmed cases and cases under investigation, as well as confirmed epizootics, and epizootics under investigation.

Figure 2. Geographic distribution of reported human yellow fever cases and yellow fever epizootics, 31 January, 2 March, and 6 April 2017.



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

Since the beginning of the outbreak up to 6 April 2017, a total of 2,871 nonhuman primates (NHP) epizootics were reported, of which 474 were yellow fever confirmed, 997 remain under investigation, and 77 were discarded. Between the release by Brazil of bulletins # 34 and 35 concerning yellow fever,⁶ an additional 159 epizootics in NHP were added, with the majority of them occurring between January and April of 2017 and being entered into the register system retrospectively.

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

⁶ Monitoring of yellow fever cases and deaths in Brazil. 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>

Reports of epizootics currently under investigation in states bordering Argentina, Bolivia, Colombia, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela represent a risk of spread of the virus to the bordering countries, especially in areas with similar ecosystems.

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/#>

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; Situational Room for Health Situation Analysis – EW 13 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 13. 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