Epidemiological Update
Yellow Fever

24 May 2017

Situation summary in the Americas

Since epidemiological week (EW) 1 to EW 19 of 2017, **Brazil**, **Colombia**, **Ecuador**, **Peru, the Plurinational State of Bolivia,** and **Suriname** have reported suspected and confirmed yellow fever cases.

The following is an update on the situation in Brazil. The situation in the other countries was reported in the epidemiological update of 25 April 2017 and in previous updates, and no significant changes have been reported since then.

In **Brazil**, since the beginning of the outbreak in December 2016 up to 18 May 2017, there were 3,192 suspected cases of yellow fever reported (758 confirmed, 1,812 discarded, and 622 remain under investigation), including 426 deaths (264 confirmed, 120 discarded, and 42 under investigation). The case fatality rate (CFR) among confirmed cases is 34%.

According to the probable site of infection,[1] the cases were reported in 398 municipalities, while the confirmed cases were distributed among 131 municipalities in 7 states (Espírito Santo, Goiás, Minas Gerais, Pará, Rio de Janeiro, São Paulo, and Tocantins).

With regard to the confirmed fatal cases and their probable site of infection, 80 were in Espírito Santo, 1 in Goiás, 164 in Minas Gerais, 4 in Pará, 5 in Rio de Janeiro, and 10 in São Paulo. In the states with more than 5 confirmed deaths, the CFR among confirmed cases is 50% in São Paulo, 35% in Rio de Janeiro, 34% in Minas Gerais and Espírito Santo.

No cases or epizootics were confirmed in new municipalities in Espírito Santo (ES), Minas Gerais (MG), and São Paulo (SP) in the last two weeks. The dates of symptoms onset of the most recently confirmed cases are 14 March 2017 (MG), 19 April (SP), and 24 April (ES).[2]

The state of Pará continues to report four confirmed cases in EW 13 of 2017, and the state of Tocantins reported a confirmed case in EW 16 of 2017. In addition, a case was confirmed in the state of Goiás in an area known to be at risk for yellow fever.

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[1] There are also 24 discarded cases that were reported by other Federal Units.
[2] Source: Report #41 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/l1-svs/27300-febre-amarela-informacao-e-orientacao and Yellow fever epidemiological update. Espírito Santo Health Secretariat. Available at: http://www.saude.mg.gov.br/component/gmg/story/9324-informe-epidemiologico-da-febre-amarela-26-04

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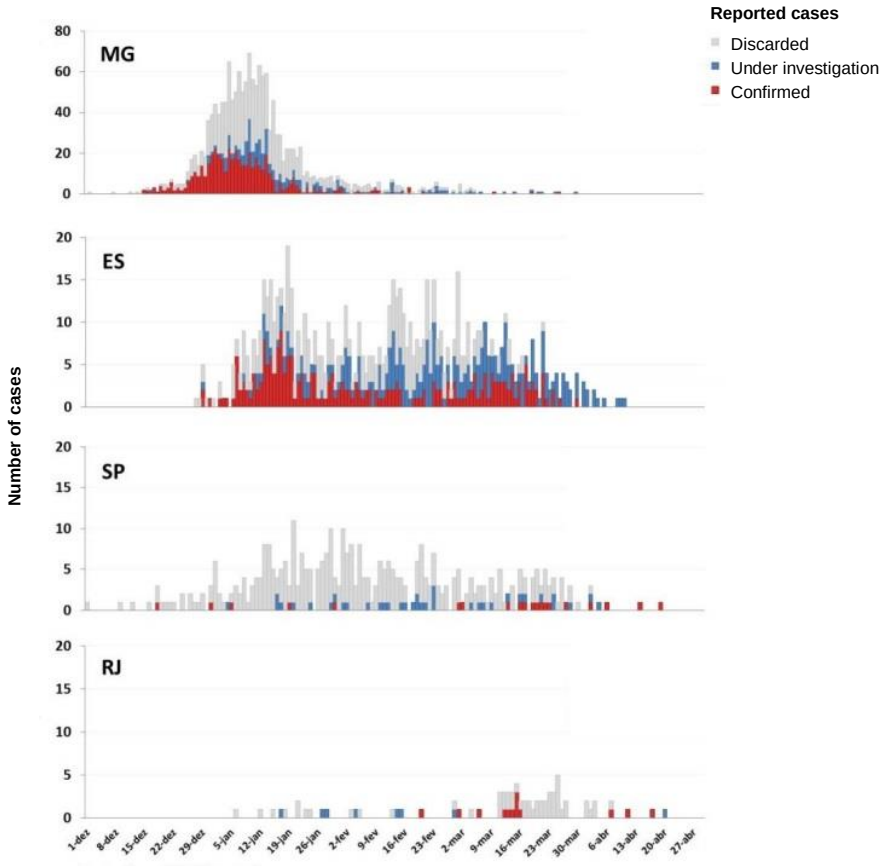
Although no confirmed cases have been reported to date in the state of Bahia, since the beginning of the year up to 8 May 2017, a total of 255 epizootics were reported in 78 municipalities; 54 of these epizootics were positive for yellow fever by RT-PCR in 28 municipalities, and 4 were in neighborhoods of Salvador.[3]

To date, the *Aedes aegypti* vector has not been reported to have a role in transmission. However, confirmed epizootics in large cities, such as Vitoria in Espírito Santo[4] and Salvador in Bahia,[3] represent a high risk for a change in the transmission cycle.

Figure 1 shows the trend in the number of reported cases, according to their actual classification (confirmed, discarded, under investigation), in the 4 states that account for 99% of all the confirmed cases.

Figure 1. Distribution of reported yellow fever cases by date of symptoms onset and probable state of infection. Brazil, 1 December 2016 to 18 May 2017.



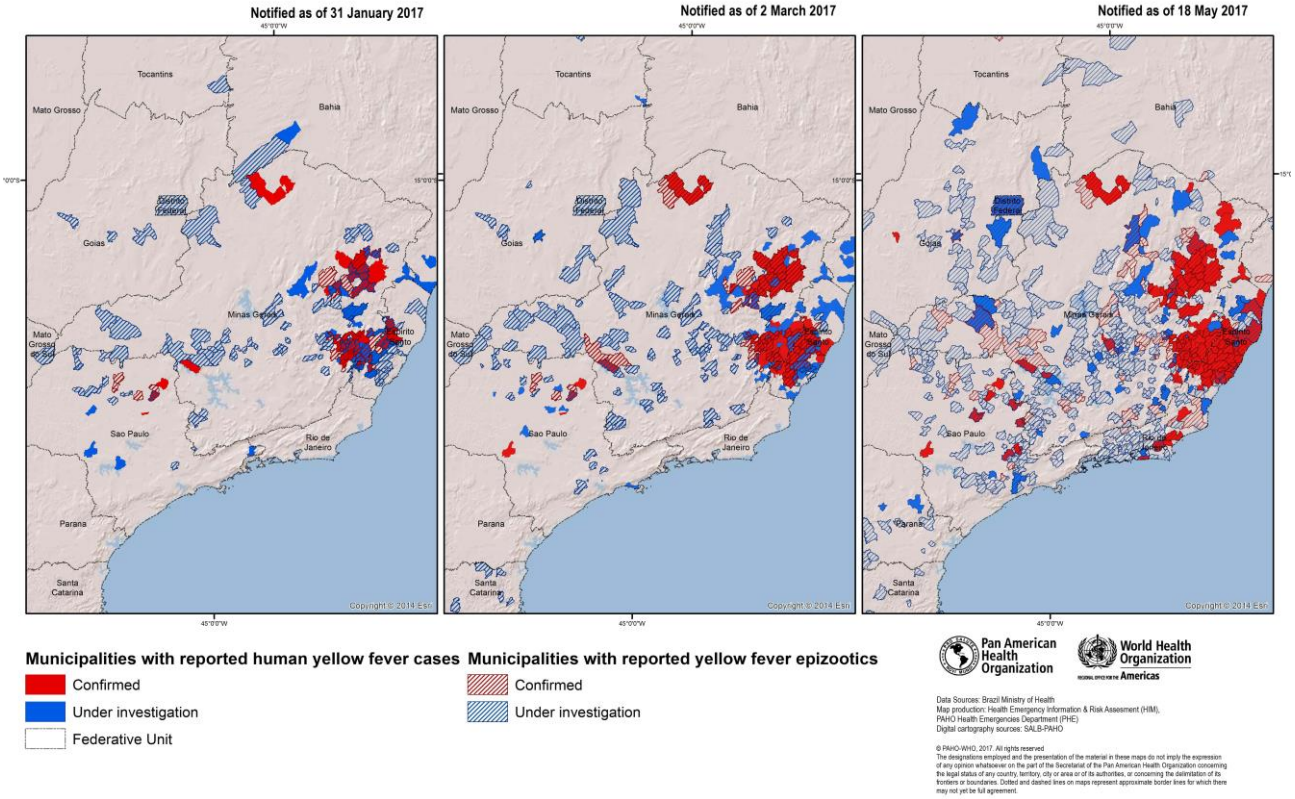
MG: Minas Gerais, SP: São Paulo, ES: Espírito Santo, RJ: Rio de Janeiro.

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

[3] Yellow fever epidemiological update. Bahia Health Secretariat. Available at: http://www.suvisa.ba.gov.br/sites/default/files/Boletim%20FA%20n%2005%2008.05.2017.pdf
[4] Municipalities with confirmed epizootics. Available at: http://saude.es.gov.br/Not%C3%ADcia/febre-amarela-silvestre-94-notificacoes-descartadas

Figure 2 illustrates the municipalities with confirmed cases and cases under investigation, as well as confirmed epizootics, and epizootics under investigation that correspond to the cumulative total in three different dates.

Figure 2. Geographic distribution of human cases (confirmed/suspected) and confirmed epizootics of yellow fever, 31 January, 2 March, and 18 May 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 18 May 2017, a total of 3,660 deaths in nonhuman primates (NHP) were reported, of which 565 were confirmed for yellow fever, 96 were discarded, and 1,467 remain under investigation. Between the release of yellow fever bulletins # 39 and 41 by the Brazil Ministry of Health,[5] the number of reported deaths in NHP did not change.

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.

[5] Source: Epidemiological reports on the yellow fever situation in Brazil are available at: http://portalsaude.saude.gov.br/index.php/o-ministerio/principal/leia-mais-o-ministerio/619-secretaria-svs/l1-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.

With regard to the outbreak response implemented by the Brazil Ministry of Health, between January and May 2017, 24.5 million doses of yellow fever vaccine were distributed to intensify the selective vaccination strategy in 1,028 municipalities of the states of Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo. As of 18 May, administrative coverage equal to or greater than 95% was reached in 285 municipalities; coverage between 75 and 94.9% was reached in 375 municipalities; and, coverage of less than 75% was reached in 368 municipalities (92 of these municipalities have coverage lower than 50%).

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 informed and vaccinated, when heading to areas where yellow fever vaccination is recommended.

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% coverage[6] among the resident population of these areas.

2) Member States that are not currently experiencing outbreaks should not conduct immunization campaign. 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.

[6] 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 from: 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 / mm^3 requiring vaccination.
- Pregnant women should be vaccinated in an emergency situation and following 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

- 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

- 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/l1-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. Brazil Ministry of Health. Yellow fever reports. Available at: http://portalsaude.saude.gov.br/index.php/o-ministerio/principal/leia-mais-o-ministerio/619-secretaria-svs/l1-svs/27300-febre-amarela-informacao-e-orientacao

2. 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