Between 6 November and 15 December 2020, 52 suspected cases of yellow fever (YF), including 14 deaths were reported in Guinea. A total of 50 cases were reported from the health district of Koundara in north-west Guinea, one from the health district of Dubreka (near Conakry, in the south-west) and one from the health district of Kouroussa, in the center of the country. Analysis performed at the Nongo, Conakry Laboratory of Viral Hemorrhagic Fevers revealed that 10 cases of suspected YF were IgM positive for YF. Of these, 8 were from unvaccinated suspect cases from Koundara, 1 was from Dubreka, and 1 from Kouroussa. Additional testing at the Institut Pasteur de Dakar (IPD) in Senegal similarly found that 8 samples from Koundara had signals positive for YF. The two cases from Dubreka and Kourasssa were subsequently discarded as it was negative on IgM or plaque reduction neutralization testing at IPD. On differential testing of the 8 samples from Koundara, 7 out of 8 YF IgM positive results were also IgM positive for at least one of the following: Dengue, West Nile Virus and/or Zika. Seroneutralization (PRNT) testing found that 7 out of the 8 samples were PRNT positive for Yellow Fever. Two samples were also PRNT positive for Zika and/or West Nile Virus, and PRNT for Dengue is ongoing. As the titres for Yellow Fever were approximately 4-fold higher than for other viruses, they are interpreted as confirmed for yellow fever. Four samples were also tested by IP Dakar for yellow fever plus other Flaviviruses and Viral Hemorraghic Fevers (VHF) by differential PCR and all were found to be negative.

The Koundara Health District, where 50 of the 52 cases (96%) were reported, has 7 health areas including an urban commune (Koundara Center). The geographic distribution of the notifications are as follows:

- Guinguan (4 suspected cases including 2 IgM + cases and 2 deaths)
- Koundara Center (8 suspected cases including 1 IgM + case and 3 deaths)
- Kamabi (9 suspected cases including 1 IgM + and 1 death)
- Sambiaio (21 suspected cases including 4 IgM + and 6 deaths)
- Sareboido (4 suspected cases 0 IgM + and 1 death)
- Youkounkoun (3 suspected cases 0 IgM + and 1 death)
- Termesse (1 suspected case 0 IgM + and 0 deaths)
Of the 50 suspected YF cases from Koundara 34 (68%) were male. For cases in Koundara, the most affected age group is 5-14 years with 27 cases (59%), followed by 1-4 years with 14 cases (30%) and the age group ≥ 15 years with 5 cases (11%). Out of 14 registered deaths, 9 occurred at a hospital and 5 in the community. Among the 14 deaths, 4 samples were taken; all of which were negative for YF.

The yellow fever vaccination status for the 50 notified cases within Koundara from 06 November to 09 December is as follows: vaccinated (without card) 1 case (2%); unvaccinated: 31 cases (62%); and status unknown: 18 cases (36%).

Following the notification of the first three confirmed IgM positive cases, 2,912 children (9-59m) were vaccinated against yellow fever.

Guinea is a high risk endemic country according to the EYE (Eliminate Yellow fever Epidemics) global strategy classification. The country thus implements routine vaccination for children from 9 months of age, international travelers and organizes preventive and response campaigns according to the epidemiological context. According to WHO-UNICEF estimates, the vaccination coverage against yellow fever in Guinea has been 40% for the years 2016 to 2019, beneath the level necessary to sustain population immunity. A survey of yellow fever vaccination carried out in the community in Koundara district found that coverage is very low (16%). This low coverage suggests that a high proportion of the population is at risk, particularly children born after the 2005 mass vaccination campaign in Boke and any older person who was missed in past vaccination campaigns. The last tranche of preventive mass vaccination campaigns in Guinea was completed in 2010.

Figure 1. Geographic distribution of suspected and confirmed cases of yellow fever per 100,000 inhabitants by sub-prefecture, in the health district of Koundara, 30 November 2020

[Image of map showing geographic distribution]
An entomological survey was carried out to identify and investigate the likely points of contact between Aedes mosquitoes and humans. The capture of nymphs or larvae in backwaters, water supply points, households and surrounding stagnant water in the localities of Sareboilo, Guingan, Kamaby and Urban Commune revealed mosquitoes of the genus Aedes, with the possibility of direct contact with the local population. In addition, in the prefecture of Koundara, there are factors conducive to sylvatic spillover of YF virus into human populations, including the presence of many non-human primates (NHPs) and the natural and animal parks (Niékolobadjar Park and the classified forest of N’Dama where NHPs are found).

**Public health response**

The Koundara Health District Public Health Emergency Operation Center set up a response coordinated by the Ministry of Health. Response activities implemented include in-depth investigations around suspected YF cases, active case finding, initial reactive vaccination around suspected YF cases, clinical management, vector control, risk communication and community engagement, transport and analysis of samples to the laboratory in Conakry and the Institut Pasteur in Dakar, communication within the framework of the IHR, and the development of an ongoing response plan.

WHO and its partners will continue to support local authorities in implementing targeted vector control measures in urban centres to interrupt transmission to control the current epidemic.

**WHO risk assessment**

Eight IgM positive cases were reported from four prefectures of Koundara district. Subsequent analysis by the regional reference laboratory IPD has confirmed yellow fever. The district is noted to have risk factors for a spread of the yellow fever virus, including documented Aedes species, parks inhabited by monkeys, forests extending to neighboring countries (Senegal, Guinea Bissau) and suboptimal YF vaccination coverage. The occurrence of suspected YF cases in urban and peri-urban areas with largely unvaccinated populations increases the risk of epidemic amplification.

The risk at the national level is considered high because of the large number of cases with an unusual age profile of young children in a short period of time, with a focus in Koundara. The risk at the regional level is considered moderate given the geographic location of the suspected YF cases and potential population movements.

**WHO advice**

Yellow fever is an acute viral hemorrhagic disease transmitted by infected mosquitoes and has the potential to spread rapidly and have serious public health consequences. There is no specific treatment, although the disease can be prevented with a single dose of yellow fever vaccine, which provides lifelong immunity. Supportive care to treat dehydration, respiratory failure and fever, and antibiotic treatment for
associated bacterial infections are recommended. Vaccination is the most important way to prevent infection.

Guinea is one of a group of 27 high risk endemic countries according to the EYE (Eliminate Yellow Fever Epidemics Global Strategy) classification. The reactive mass vaccination campaigns, organized as a matter of urgency to protect populations during the 2002 YF epidemic, helped limit the impact of the epidemic. Guinea conducted phased preventive vaccination campaigns against yellow fever in 2005 and 2010, with a 95% vaccination coverage. Vaccination is the main way to prevent and control yellow fever. The unusual age profile of the current cluster of suspected YF cases highlights both the importance of maintaining strong YF vaccination coverage through routine immunization, and also the importance of ruling out other causes of acute febrile jaundice through differential diagnosis.

Vaccination against yellow fever is safe, highly effective and provides lifelong protection. According to IHR (2005), the validity of the international certificate of vaccination against yellow fever extends for the life of the person vaccinated. A booster dose of yellow fever vaccine cannot be required of international travelers as a condition of entry.


WHO recommends vaccination against yellow fever for all international travelers aged 9 months and over, to Guinea. Guinea also requires a certificate of vaccination against yellow fever for travelers aged 9 months and over coming from countries at risk of yellow fever transmission, and for travelers who have passed through the airport for more than 12 hours.

WHO encourages Member States to take all necessary measures to keep travelers well informed about YF risks and preventive measures, including vaccination. Travelers should also be made aware of the symptoms and signs of yellow fever and be advised to seek medical attention promptly when they show signs. Returning viraemic travelers may pose a risk for the establishment of local cycles of yellow fever transmission in areas where the vector is present.

The updated areas at risk for yellow fever transmission and related recommendations for vaccination of international travelers were updated by WHO on July 1, 2020; the revised risk area map and yellow fever vaccination recommendations are available on the WHO International Travel and Health website. WHO does not recommend any restrictions on travel and trade in Guinea based on the information available on this outbreak.

For more information on yellow fever, please see: