



Editorial

Infectious disease risks at the Rugby World Cup 2023 in France – Beware of *Aedes* and co!

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As we approach the 2023 Rugby World Cup in France, which will start on September 8th, 2023, can we anticipate and mitigate infectious disease risks? With more than 600,000 international visitors expected to attend at venues throughout France there is a need to consider typical risks for mass gatherings and specific risks based on local epidemiology. The venues for the games are in Saint-Denis, Toulouse, Nantes, Marseille, Saint-Etienne, Lille, Lyon, Nice, Bordeaux (Fig. 1). Typical for large sporting events are gastrointestinal infections, respiratory infections such as influenza and sexually transmitted infections [1,2] but this editorial focuses on arthropod-borne infections. A main concern currently in France is the potential for the transmission of arboviral infections such as dengue, chikungunya, and possibly Zika and other vector-borne infections such as West Nile virus and Usutu virus. Vector-borne diseases are transmitted by arthropods such as mosquitoes, ticks, and sandflies. They can cause a range of illnesses, from mild fevers to severe neurological complications and even death. Local transmission of arboviral infections is increasing in Europe with several autochthonous cases of infection reported since 2020 especially in the South of France in the regions of Occitania and Provence-Alpes—Cote d'Azur where 65 autochthonous dengue cases were reported in 2022 and four cases in 2023 [3–6]. The last French autochthonous chikungunya outbreak occurred in 2017 with nine cases in Le Cannet-des-Maures (Var department) [7]. Three cases of French autochthonous Zika were documented in 2017 in Hyères (Var department) [8]. The *Aedes* mosquito is the vector of dengue and chikungunya and the Zika virus. *Aedes albopictus*, first detected in 2004 in the South of France, has spread northwards and is now widely distributed. Optimal climatic conditions have led to an increase in *Aedes* overwintering survival, frequency of biting and faster viral development in the mosquito.

A study evaluating the risk of dengue fever transmission during the Hajj pilgrimage in Saudi Arabia recommended the implementation of effective vector control measures, including insecticide spraying and larvicide treatments, to reduce the risk of transmission [9]. Such anti-mosquito measures are already being implemented in France and

even the 13th arrondissement in Paris has been sprayed with insecticide after a traveller returned to France with a dengue infection, to try and prevent the spread of the infection to others through mosquito vectors [10].

Rare cases of Toscana virus infections have also been reported in Southern France, notably in Corsica in areas where sand flies are prevalent [11].

An earlier study of infection risks associated with mass gatherings analyzed the risk of vector-borne diseases during the 2016 Summer Olympics in Brazil, which attracted millions of visitors from around the world. The study found that the risk of vector-borne diseases, including Zika virus and dengue fever was very low so this augurs well for the French games.

However, the specific risk of the vector-borne viruses depends on the specific pathogen. West Nile Virus (WNV) is a flavivirus that is primarily transmitted to humans through the bite of infected mosquitoes. The risk of WNV transmission is highest in areas with high mosquito activity and warm climates. In one study, WNV was prevalent in mosquito populations in areas surrounding outdoor music festivals in California, highlighting the risk of transmission in mass gathering settings. In 2023, to date, there have been five confirmed cases of West Nile infection in France, in the southeast and southwest of the country. Additionally, vector competence studies have shown that not only *Culex* mosquitoes, but also *Aedes* species found in France, have the potential to transmit West Nile virus and Usutu virus [12,13].

It appears then, that arboviral and other mosquito-borne infections will pose a risk for players and travellers attending the Rugby World Cup in France due to the presence of competent vectors, suitable climatic conditions, and the fact that some players, teams and spectators are coming from dengue endemic areas and may be viremic. Mosquito bite protection such as DEET repellents for the skin and clothing impregnated with an insecticide such as permethrin are recommended especially during the day (to protect against *Aedes* spp) but also at night (*Culex* spp). Follow up on illness acquired by Rugby World Cup

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Fig. 1. Map of Locations in France with Rugby World Cup 2023 events.

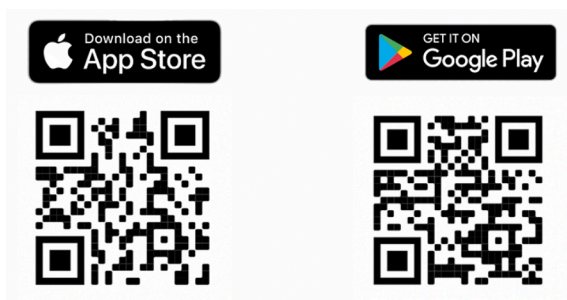


Fig. 2. QR Codes to download the free travel health app, ITTT on the Apple App Store and Google Play Store.

attendees could be considered and this could be done using an innovative App such as ITTT (Illness Tracking in Travellers) (itit-travelhealth.org) [14]. ITTT is a public health tool, with the World Health Organization (WHO) as partner and collates real-time data on illness in all types of travellers including mass gathering visitors. This free App is available for download (Fig. 2).

Just as the whistle is about to blow, the authors of this editorial are hooting for different teams but at the end of the day - “bonne chance” to all and let the best team win!

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