

The threat of dengue in Europe

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Dear Editor,

Dengue fever is the most widespread arboviral disease in the world and is transmitted by infected *Aedes* mosquitoes. In the last 60 years, the number of cases has increased almost five thousandfold. It is divided into classical and severe dengue, which are associated with very different symptoms and consequences. Treatment of dengue fever is largely supportive with fluids and pain management. To prevent dengue fever, measures to prevent mosquito bites are key, and, in some areas, and for some persons, vaccination (Dengvaxia) is recommended [1].

Dengue is increasingly seen as a public health threat for Europe. The vector of dengue is the *Aedes* mosquito. This day-time active mosquito is the ideal vector due to its preference for urban habitats, the increasing proximity of the habitats to humans, and the anthropophilic choice of blood for female mosquitoes [2]. *Aedes* mosquitoes are present in Europe, especially *Aedes albopictus* and have a temperature dependent development time. Optimal environmental conditions for faster development are increasingly prevalent in Europe with higher temperatures caused by climate change and a resulting increase in *Aedes* survival, biting frequency and virus development. Also very important is the large number of viraemic travellers

returning from dengue-endemic areas. Traps, insecticides, and other methods are used to try and control the population of the *Aedes* mosquito; however, this is not only complicated by the countless possible egg-laying places in small pools of standing water (including flowerpots) and the development of insecticide resistance, but also factors such as costs, time, and public health efforts. National surveillance bodies and the European Centre for Disease Control and Prevention (ECDC) monitor imported cases of dengue, but numbers are likely to be gross underestimates as the infection is often very mild and cases are undetected. Due to these factors, it is of paramount importance to detect autochthonous dengue cases in Europe, where the mosquito vector may be present, but where dengue is not yet endemic.

Aedes albopictus was first detected in the south of France in 2004 and has spread northwards over the years. In 2010, an autochthonous transmission was reported for the first time in France. Since then, the number of annual autochthonous infections has increased from 1 (2010) to at least 60 (year to date, September 2022) mainly in the regions Occitania and Provence-Alpes-Côte d'Azur (PACA). The year 2021 was exceptional as there was only one autochthonous transmission in France due to less travel because of the COVID-19 pandemic and thus fewer imported dengue cases [3]. As the Asian tiger mosquito can only transmit dengue if it has previously bitten an infected person, autochthonous infections also decreased.

In recent years, there has also been an increase in dengue cases in Italy. The first autochthonous outbreak of dengue fever was reported in the summer of 2020 in the Veneto region in Northern Italy with 11 linked cases. The 11 autochthonous cases were all linked to a primary case, a woman in her thirties who returned from a 16-month stay in Indonesia to her hometown in Italy. Many household members including people who lived within a 200m radius were infected. Vector control measurements were quickly implemented. Moreover, with Covid-19, being the main focus at that time, differential diagnoses among febrile illnesses turned out to be more challenging with subsequent under-reporting and inadequate testing when it came to non-Covid-19 cases [4].

In Switzerland, continuous surveillance of imported dengue fever cases and vectors has shown a clear upward trend in the past few years. A dip in imported dengue cases occurred during the pandemic, highlighting the fact that travel to endemic countries is a deciding factor for dengue fever infection (see Fig. 1). Post-pandemic, imported cases of dengue have risen sharply [5]. Intense surveillance of imported dengue and autochthonous cases is crucial to public health. Rising temperatures in Europe require increasing vigilance to combat arboviral disease and

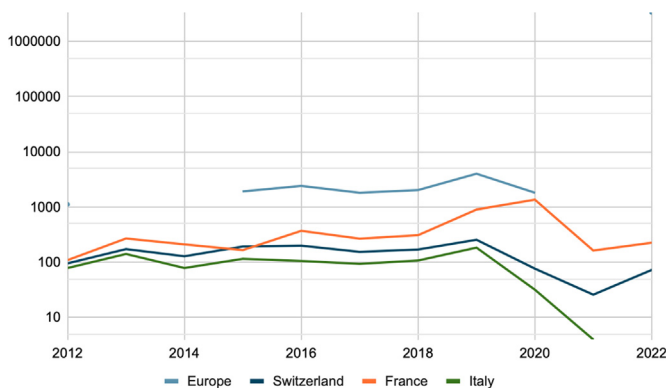


FIG. 1. Dengue fever cases in Switzerland, France, Italy, and Europe in the last ten years.

their mosquito vectors. Imported and autochthonous dengue in Europe constitute a threat that will become more and more relevant in the near future.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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