

Position Statement

September 2024

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Dengue Virus

Background

Dengue is a mosquito-borne viral disease caused by the dengue virus. It is the most common insect-borne disease worldwide and has spread rapidly around the world over recent years.

The virus is primarily transmitted through the bite of an infected female *Aedes aegypti* (main vector) or, less widespread, an infected *Aedes albopictus* (Asian Tiger) mosquito. *Aedes albopictus* has been identified as the primary vector for dengue transmission in areas where *Aedes aegypti* is not present. *Aedes aegypti* is found worldwide between latitudes 35°N and 35°S, and dengue is currently considered endemic in over 140 countries, covering at least 50% of the world's population.¹ However, *Aedes albopictus* has undergone a dramatic global expansion facilitated by human activities, in particular the movement of used tyres and bamboo. Together with passive transit via public and private transport, this has resulted in a widespread global distribution of *Aedes albopictus*, now listed as one of the top 100 invasive species.²

Dengue infection gives rise to a wide spectrum of disease. A vast majority of cases (up to 75%) are asymptomatic or mild and self-managed with resolution within two to three weeks, and hence the actual number of dengue cases is under-reported. Symptomatic cases may range from nonspecific acute febrile illness to severe disease including dengue haemorrhagic fever and dengue shock syndrome; many cases are highly likely to be misdiagnosed as other febrile illnesses.

There are four distinct variants of dengue virus, all of which have the potential to cause all forms of the disease. Infection with one variant confers lifelong immunity to that variant, but only short-term protection against other variants. Subsequent infection with a second variant increases the risk of developing dengue haemorrhagic fever.

One modelling estimate indicates 390 million dengue virus infections per year (95% credible interval 284–528 million), of which 96 million (67–136 million) manifest clinically (with any severity of disease). Another study on the prevalence of dengue estimates that 3.9 billion people are at risk of infection with dengue viruses. Despite a risk of infection existing in over 140 countries, the number of cases in the Caribbean, and Central and South America has been increasing over recent years, where dengue fever is found mostly during or shortly after the rainy season due to more intense mosquito activity.

Since the beginning of 2024 to August 2024, over 12 million dengue cases and over 8,000 dengue-related deaths have been reported from 86 countries/territories worldwide, this represents a 230% increase from the same period in 2023.³ Most cases have been reported from Brazil (over 9 million), followed by Argentina, Paraguay, Peru and Colombia.⁴

Dengue in the EU/EEA

Dengue is not endemic in mainland EU/EEA with most cases in travellers infected outside of Europe. Among European travellers returning from low- and middle-income countries, dengue is the second most diagnosed cause of fever after malaria. From 2017 to 2019, the number of reported cases in the EU/EEA (excluding the UK) ranged from 1,563 in 2017 to 3,743 in 2019 although cases decreased in 2020 and 2021, a trend likely linked to restricted international travel during the COVID-19 pandemic. In 2022 (the most recently published ECDC full report), dengue case numbers increased again, with 27 EU/EEA countries (the UK is no longer included in these reports) reported 1,757 cases of dengue.⁵ Most travel related cases were imported from the Americas, mainly from Cuba (38%).

The possibility of widespread dengue infections becoming established in Europe may also be helped by the spread of *Aedes albopictus* across Europe. The mosquito has been present in the Mediterranean areas of southern European countries for some time, but in France has recently been reported to have spread as far north as Brittany.

Local dengue transmission was reported for the first time in 2010 in France and Croatia. In 2012, an outbreak of dengue on the Madeira islands of Portugal resulted in over 2,000 cases and imported cases were detected in mainland Portugal and ten other countries in Europe. Autochthonous cases are now observed on an almost annual basis in many European countries, although between 2013 and 2019 less than ten locally acquired cases were reported annually in the whole region. Case numbers have increased steadily since 2022, with outbreaks in France, Italy and Spain (71 cases in 2022, 130 in 2023 and 202 cases to mid-October 2024).⁶ To date, all autochthonous outbreaks of dengue in mainland EU/EEA have occurred between June and November.³ For current information on regions in Europe with a 28-day deferral period for returning donors see the Geographical Disease Risk Index (GDRI).⁷

Dengue in the UK

Currently, the probability of infection is considered ‘Very Low’ for the UK population, given the absence of established (evidence of reproduction and overwintering) competent mosquito vector populations in the UK required for dengue virus transmission.⁸

All cases reported in the UK have been imported by travellers returning from endemic countries. The true incidence of dengue infections in UK travellers is likely to be under-reported due to the high proportion of asymptomatic cases. In England, Wales and Northern Ireland (EWNI) in 2022 there were 634 cases of which 576 were confirmed cases of dengue; an increase compared to previous years with 448, 95 and 102 reported cases in 2022, 2021 and 2020 respectively. Travel history was known for 579 out of the 634 cases in 2023 (91%), with most reporting travel to Southern Asia (40%) and South-Eastern Asia (24%). India was the most frequently reported country for all dengue cases (146 cases).⁹

There is no evidence of person-to-person transmission of dengue virus except via blood and other donated products. Blood donations in countries with outbreaks of dengue have been found to contain virus and cases of transmission via blood transfusion and through solid organ and tissue transplantation have been reported. Two vaccines against dengue are now licensed in many countries.¹⁰ At this time WHO recommends pre-vaccination screening to limit vaccination to dengue seropositive persons¹¹ as individuals that have not been previously infected may be at risk of developing severe dengue if they get dengue after being vaccinated. However, treatment in most non-endemic countries is currently symptomatic only.

Travellers to many dengue-affected areas will be excluded from donation for four months under current malaria guidelines, but not all affected areas are covered by malaria exclusions. Travellers returning from dengue affected areas should not donate blood or tissues for six months from their return to the UK if

they have been (or may have been) infected with dengue virus, or for four weeks from their return if they are fit and well and have had no symptoms suggesting that they may have been infected with dengue virus.

Information about international outbreaks of dengue is available from the National Travel Health Network and Centre (NaTHNaC).¹² Countries affected by dengue virus and any applicable time limits are available on the JPAC website, shown in the GDRI⁷ and any associated Change Notifications.¹²

References

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