Joint UKBTS Professional Advisory Committee ([1])

Position Statement

Dengue virus

September 2021

Approved by: Standing Advisory Committee on Transfusion Transmitted Infections

<u>September 2021</u> - The contents of this document are believed to be current. Please continue to refer to the website for in-date versions.

<u>Background</u>

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 35ºN and 35ºS, and dengue is currently considered endemic in over 140 countries, covering at least 40% of the world's population. 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.

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 2-3 weeks, and hence the actual numbers of dengue cases are 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 the 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, 70% of the actual burden is in Asia, although 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.

Dengue in the EU/EEA

As part of the global increase in cases the virus is spreading to new areas, including Europe, and in addition to sporadic cases explosive outbreaks are also occurring. The threat of an outbreak of dengue now exists in Europe; local transmission was reported for the first time in France and Croatia in 2010 and imported cases were detected in 3 other European countries. In 2012, an outbreak of dengue on the Madeira islands of Portugal resulted in over 2000 cases and imported cases were detected in mainland Portugal and 10 other countries in Europe. A further larger cluster of cases was identified in France in 2015, originating from an infected traveller returning from French Polynesia

Autochthonous cases are now observed on an almost annual basis in many European countries. Among European travellers returning from low- and middle-income countries, dengue is the second most diagnosed cause of fever after malaria.

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 now spread as far north as Brittany.

For 2019 (the most recently published full report), 27 EU/EEA countries reported 4 363 cases of dengue, of which 4 020 (92%) were confirmed. The number of cases in 2019 was almost double that for 2018, reflecting the intense circulation of the virus on a global scale. Sixty-four percent of the cases with known probable country of infection were imported from Asia, mostly from Thailand and India.

In 2019 there were 12 autochthonous cases were reported from the EU/EEA, in France (n=9), Spain (n=2) and Germany (n=1). Most of these cases were the result of the virus being transmitted by a mosquito vector, but one case in Spain resulted from sexual transmission (the first ever report of sexual transmission of dengue) and the case in Germany was the result of laboratory transmission. In 2020 there were 22 autochthonous cases reported, in France (n=12) and Italy (n=10), all from mosquito transmission. Up to the end of August 2021, there has been just one case reported, in France. All information from the ECDC document - *Autochthonous transmission of dengue virus in mainland EU/EEA, 2010-present*.

Dengue in the UK

At this time indigenous dengue infection does not occur in the United Kingdom, and active dengue surveillance is not performed. All cases reported 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 the UK in 2019 (most recently published data at time of preparing this 2021 revision) there were 827 reported cases of dengue, of which 92% were confirmed. The number of reported cases in 2019 had increased significantly over previous years reflecting a sudden and significant global increase, reported cases from 2015 to 2018 being 423, 468, 465, and 432 respectively.

Information about international outbreaks of dengue is available on the National Travel Health Network and Centre (NaTHNaC) website: http://travelhealthpro.org.uk

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. A vaccine against dengue is now licensed in many countries. At this time WHO recommends that it is only given to persons with confirmed prior dengue infection as individuals that have not been previously infected may be at risk of developing severe dengue if they get dengue after being vaccinated. However, in most non-endemic countries treatment 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 infected or may have been infected with dengue virus, or for four weeks from their return if they have had no symptoms suggesting that they may have been infected with dengue virus.

Countries affected by dengue virus and any applicable time limits are shown in the Geographical Disease Risk Index (GDRI) and any associated Change Notifications.