Experts warn of potential upsurge in mosquito and tick-borne diseases as UK climate gets warmer

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Climate change could accelerate the emergence of vector-borne diseases such as chikungunya, dengue fever, and West Nile virus in the UK, warn leading public health experts Dr Jolyon Medlock and Professor Steve Leach from the Emergency Response Department at Public Health England, writing in *The Lancet Infectious Diseases* journal.

Findings from the Review indicate that vector-borne diseases, which are transmitted by insects such as mosquitoes and ticks, are on the rise and have spread into new territories across Europe over the past decade (eg, malaria in Greece, West Nile virus in eastern Europe, chikungunya in Italy and France).

The authors say disease-carrying mosquitoes could also become widespread across large parts of Britain within the next few decades as the climate becomes increasingly mild. More rainfall and warmer temperatures could provide ideal conditions for the Asian tiger mosquito (Aedes albopictus), which spreads the viruses that cause dengue and chikungunya, to breed and expand into the UK, particularly southern England. Climate change models predict suitable temperatures for 1 month of chikungunya virus transmission in London by 2041, and up to 3 months in southeast England by 2071 (see table, page 2).

Previously dengue transmission was largely confined to tropical and subtropical regions because freezing temperatures kill the mosquito's

larvae and eggs, but rising temperatures could enable A albopictus to survive across large parts of England and Wales within decades. Climate change models indicate that just a 2°C rise in temperature could extend the mosquito's activity season by 1 month and geographical spread by up to 30% by 2030 (see table, page 2).

"Given the ongoing spread of invasive mosquitoes across Europe, with accompanying outbreaks of dengue and chikungunya virus, Public Health England has been conducting surveillance at seaports, airports, and some motorway service stations. Although no non-native invasive mosquitoes have been detected in the UK so far, a better system to monitor imported used tyres, in which disease-carrying mosquitoes lay their eggs, needs planning," says Dr Medlock.

The UK climate is already suitable for the transmission of West Nile virus which can be spread by several mosquitoes already found in the UK. However, a low number of mosquitoes and the limited spread of human-biting Culex spp have prevented any human cases so far. In the future, rising temperatures could make conditions more favourable for mosquitoes, say the authors. Moreover, the recent discovery of the Culex modestus mosquito species—considered to be the main carrier of the West Nile virus in Europe—at a number of sites across Kent could provide a suitable vector for transmission of the virus between infected birds and humans.

According to Professor Leach, "We are not suggesting that climate change is the only or the main factor driving the increase in vector-borne diseases in the UK and Europe, but that it is one of many factors including socioeconomic development, urbanisation, widespread land-use change, migration, and globalisation that should be considered. Lessons from the outbreaks of West Nile virus in North America and chikungunya in the Caribbean emphasise the need to assess future vector-borne disease risks and prepare contingencies for future outbreaks."

More information: *The Lancet Infectious Diseases*, www.thelancet.com/journals/lan … (15)70091-5/abstract

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