West Nile virus: the need to strengthen preparedness in Europe

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The ongoing outbreak of West Nile virus (WNV) infections in humans in Greece described in this issue of *Eurosurveillance* is a timely reminder that WNV is a re-emerging pathogen in Europe [1]. So far, WNV has been documented in animals and humans in several countries across Europe, mainly in central Europe and in the Mediterranean region. Over the last 15 years, outbreaks in horses and/or humans were reported from Romania, Hungary and Portugal, Spain, France, Italy and Greece [2].

In 2010, a single probable human case was reported in July in Portugal. Outside the European Union (EU), WNV circulation has been documented in horses in Morocco and human cases have occurred in Russia (Volgograd Oblast) and in Israel. All these regions are located along the main routes of migratory birds. The current outbreak in humans in northern Greece, is the first recognised WN fever outbreak in humans in this country. However, studies suggest that WNV has probably been circulating in humans in the region of central Macedonia in northern Greece for many years [3,4].

West Nile fever is a viral disease transmitted by mosquitoes and is distributed worldwide. The primary cycle of WNV involves ornithophilic mosquitoes and birds; some mosquito species mostly from the Culex genus can bite infectious birds and subsequently transmit the virus to humans and/or horses during another blood meal. Humans and horses are considered as dead-end hosts. The vast majority of human cases remain asymptomatic after infection and severe neuroinvasive illness is reported in less than 1% of the patients. The main risk factor for severe clinical presentation is to be an elderly person. In this age group, reported case fatality rates may reach 10% [5]. In addition the high number of non-symptomatic cases may increase the risk of WN virus transmission through blood donation or organ transplants [6].

Each WNV outbreak is unique in that there is a complex interaction of different factors in space and time that contribute to the transmission of the virus to humans. These factors range from the introduction of infected migratory birds into native local bird populations, to climatic factors that increase the abundance of competent mosquito vectors and bridge vectors, to changes in human behaviour that favour exposure to infected mosquitoes. It is this complexity that makes each WNV outbreak particular and that make development and implementation of preparedness plans for the prevention of cases in humans so difficult.

The recently reported probable and confirmed cases of WNV infection in Portugal and Greece, respectively reconfirm that this virus is actively circulating in several countries in the EU and that transmission to humans can be expected on a regular basis during the mosquito season. Also, reports of sporadic cases from several regions in Hungary during previous years indicate that WNV activity is widely distributed throughout this country and not limited to a single focus [7]. A recent study in Italy linked to infected organ donors [8] draws the same conclusion, that the virus is being transmitted in areas previously thought to not be at risk or affected. Furthermore, the case report in this issue of a Dutch traveller returning from Israel with WN infection highlights the need for awareness among physicians and laboratory staff to consider WNV infections as a differential diagnosis in cases where patients return from areas where they may have been exposed to the virus [9].

The events described above strengthen the need for integrated multidisciplinary surveillance systems and response plans. This includes raising the awareness of clinicians and veterinarians of the clinical presentation of WNV disease in humans and horses (particularly during the mosquito season from June to October), primarily in areas considered as at major risk surrounding irrigated areas and river deltas. Furthermore, strengthening the understanding of suitable habitats for birds that would increase the bird-mosquito-human interface would be of value. In terms of entomology, a thorough understanding of competent vector species, their breeding ecology, their abundance and geographic range is of significant importance in establishing limits around WNV affected areas and in the identification of potential new at-risk areas.

In addition, there is a need to have a better and more precise picture of WNV risk areas in Europe and neighbouring countries in order to implement appropriate control measures, especially guidelines for blood donation and organ transplants. Also, studies in Europe are required to better understand the cycle of transmission and the maintenance of WNV in the environment over the years to provide appropriate indicators for risk assessment.

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