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Arboviral Infections around the World

Yavuz Uyar*

Department of Medical Microbiology, Cerrahpasa School of Medicine, Istanbul University, Turkey

In recent years, climatic factors have made various mainly zoonotic and vector-borne agents, known as emerging or re-emerging agents, the most important causes of disease worldwide. Arboviruses are one of the most important groups. Arboviruses (arthropod-borne viruses), such as *West Nile Virus (WNV), Crimean Congo Hemorrhagic Fever Virus (CCHF), Sand Fly Fever Virus (SFV)* and *Dengue Virus*, are transmitted biologically among vertebrate hosts by blood-taking vectors, such as mosquito, tick, midge and sandfly arthropods [1,2].

Arboviruses include RNA virus taxa, with more than 550 having been identified, of which more than 130 species can cause infectious diseases [3]. The majority of the Arbovirus genus belongs to the *Bunyaviridae, Flaviviridae* and *Togaviridae* families, which are particularly important for public health [1]. The *Bunyaviridae* family is transmitted both by arthropods (mosquitoes, sandflies, ticks and thrips) and directly from asymptomatic vertebrate hosts (e.g., rodents). Many of these agents are well described and have similar epidemiology [4]. Transmission of Arboviruses can be vertical, while horizontal transmission can be venereal when a vertically infected male directly transmits the virus to a female vector [2]. The most important reservoir hosts for Arboviruses are birds or rodents, while the most important arthropod vectors are mosquitoes and ticks. Generally, Arboviruses require both a vertebrate and arthropod host. Arboviruses breed asymptomatically within arthropod organ and tissue cells. After the arthropod bite, viremia occurs in vertebrate host; arthropods may take virus and transfer to other vertebrate from vertebrate [5].

While Arboviruses are globally distributed, the majority are found in tropical and subtropical regions. In the past two decades, Arbovirus activity and epidemics have increased worldwide [5]. Arboviruses' changing global demographic structure has played a major role in changing the distribution dynamics of Arboviruses diseases [2]. Generally, the human population is exposed to Arbovirus infections when people travel or migrate to rural areas. Recent changes in global climate and other human, epidemiological and genetic factors have increased the need to gather more new data about the emergence of arthropod borne viruses [2].

Gross domestic product per capita and population growth were the main drivers of increases in greenhouse gas emissions, over the last three decades. So, global warming is caused by rising CO_2 and greenhouse gases in the atmosphere [6]. During the last decades, Arboviruses such as *West Nile virus, Chikungunya virus, Crimean Congo hemorrhagic fever virus,* and *Sandfly fever virus* have emerged to cause epidemics in North America, Europe and Asia [7-11]. For example, WNV epidemics have been correlated with warmer weather and more humid summers in Europe [8], while hantaviral epidemics have been correlated with mast years and rainy seasons in Europe and Minor Asia (Turkey) [12,13]. In 2009 and 2010, during particularly warm and humid summers, WNV outbreaks occurred in Russia, Greece and Turkey [14], while sand fly activity increased and sand fly fever epidemics occurred in Turkey [11,15].

In short, global warming and climate instability are playing an increasing role in driving the emergence and redistribution of infectious diseases globally [1]. Such global ecological changes, amount of annual rainfall, intercontinental migration of viral reservoirs (e.g. birds) and economic status of countries may strongly affect the distribution of arboviral infections [7,8]. Therefore, arbovirus infections will remain an important public health problem for a longer period.

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***Corresponding author:** Yavuz Uyar, Department of Medical Microbiology, Cerrahpasa School of Medicine, Istanbul University, Turkey, Tel: 9002124143000; E-mail: yavuz_uyar@yahoo.com

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