

## Climate change and future infectious diseases: A growing threat

**Ayse Arikan**

Near East University, DESAM Research Institute, Nicosia, 99138, Cyprus, Near East University, Department of Medical Microbiology and Clinical Microbiology, Nicosia, 99138, Cyprus and Kyrenia University, Department of Medical Microbiology and Clinical Microbiology, Kyrenia, 99320, Cyprus

**Nedim Cakir**

Near East University, Department of Medical Microbiology and Clinical Microbiology, Nicosia, 99138, Cyprus

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Corresponding author. Near East University, Faculty of Medicine, Department of Medical Microbiology and Clinical Microbiology, 99138, Nicosia, Cyprus.  
E-mail: [aysearikancy@yahoo.com](mailto:aysearikancy@yahoo.com)

Dear Editor;

Climate change continues to pose a detrimental traumatic threat to humanity. El Niño Southern Oscillation (ENSO) and La Niña have been implicated to relate with the global climate through temperature fluctuations in the equatorial Central Pacific that trigger droughts, and floods, and create favorable habitats for infectious diseases [1]. Due to climate change, it is likely that mosquitoes, ticks and sandflies vectors or pathogens will spread rapidly to new regions in the future. The major El Niño event in 2015-2016, had a massive impact on the warming of the equatorial Pacific Ocean, and lead to trigger the incidence of certain infectious diseases including chikungunya, hantavirus, dengue, Rift valley fever, enteric fever, cholera, cryptosporidiosis, and salmonellosis. Indian Ocean Dipole (Indian Niño) another weather phenomenon, being the ocean alternately warmer (positive phase) and then colder (negative phase) than the eastern part, had also an impact on the emergence of malaria and chikungunya [2].

Recently, vector-borne infections raise concerns in many European countries. The detection of West Nile Virus (WNV) and dengue-related infections in Southern, Eastern, and even Northern Europe (Spain, Italy, Greece, Bulgaria, Romania, Hungary; Germany, Switzerland, and France, respectively) over the last decade raises concern [3,4]. The expansion of *Aedes albopictus* from Southern regions of Europe to Northern France and some parts of Germany pose a potential threat of especially dengue, chikungunya, and Zika in these countries [3,4]. The increased risk of Leishmaniasis in Europe due to the spread of *Phlebotomus sp.* from the Mediterranean to Northern France, and Germany, shifts in the geographical range and activity of *Ixodes Ricinu*, increase in Lyme disease, *Campylobacter* and *Salmonella*-related foodborne infections throughout Europe, *Leptospira interrogans*-related water-borne infections in Europe and *Vibrio* infections in the Baltic are emerging zoonosis due to climate crisis [4].

For the future, WNV is predicted to be a major risk in Europe, Turkey, Cyprus, the Eastern Mediterranean coast, Egypt and Western Syria in 2050. While *Aedes*-borne infections will pose a greater risk in North Africa and the Middle East in 2080, the distribution of vectors of Malaria and Leishmaniasis will also be affected due to the warming of the earth's temperature [5].

Considering the impact of climate change on infectious disease, threat control strategies, improved healthcare, and economic systems should be established in advance for responding better to potential global risks and their long-term severe impacts in the future. Although climate change due to natural disasters will continue, the effect of human activities on climate change must be limited.

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