

## Does Climate Change Increase Risk of Vector Borne Diseases to Humans and Animals?

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Climate change is an acknowledged fact that has seriously affected all the ecosystems of the world. Unfortunately, the impact of climate change on infectious diseases is neglected. From the year 1906 to 2005, global average temperature has increased by 0.74 degree centigrade, and since 1961, sea level has risen by approximately 2 mm per year. Besides, Arctic sea level extent has declined by 7.45 per decade, and snow covers and glaciers have diminished in both hemispheres. It is distressing to mention that the rate of change in climate is faster than in any period in the last 1000 years. Climate interacts with host, agent and vector. Climate variability caused disease and death through natural disasters such as flood, heat wave, Tsunami, and draught. The climate change, especially the global warming is known to affect the health of humans and animals, both directly and indirectly. Rapid urbanization and human activities are creating more permissive environment for the vector-host interaction. Vector is usually an arthropod or invertebrate host, which transmits the infection by inoculation into the skin or mucous membrane by biting or by depositing of infective material on the skin or on food or other objects. Many vector borne diseases such as malaria, dengue fever, yellow fever, chikungunya fever, West Nile fever, Rift Valley fever, Japanese encephalitis, leishmaniasis, blue tongue disease, plague, dirofilariasis, trypanosomiasis, schistosomiasis and tick borne encephalitis are more affected by climate change than other diseases. Furthermore, these diseases are on the rise and spread unprecedentedly, causing high morbidity and mortality in many nations of the world including India. Vector borne diseases continue to exact a significant toll on the society. It is believed that nearly half of the world population is infected by vector borne diseases. The real burden of these diseases still remains unrecognized due the under reporting. It is estimated that 68000 cases of Japanese encephalitis occur each year in Asian countries. Globally, one million cases of dengue fever are recorded every year. There were approximately 243 million malaria cases with 863,000 deaths in 2008 throughout the world. It is important to mention that 89 % of deaths due to malaria occurred in Africa. The annual economic cost of malaria has been estimated to be about US dollar 12 billion. It is reported that 50,000 people are killed per year by leishmaniasis. In India, 1.38 million people were affected due to chikungunya fever in 2006. These diseases have great public health and socio-economic importance. As climate change could be the biggest global threat of the 21<sup>st</sup> century, the emphasis is given on modeling studies for predicting the potential of transmission of these diseases to human beings. Moreover, better coordination between public health and veterinary health authorities is highly imperative for preventing the vector borne infections. It is emphasized that laboratory facilities should be made available, especially in poor resource nations for diagnosing these diseases, which carry significant impact on human as well as animal health. It is pertinent to undertake systematic and comprehensive studies on ecosystem of vector borne disease causing pathogens both in hosts and vectors. It is recommended that economic, social and public health burden of these diseases should be studied.

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