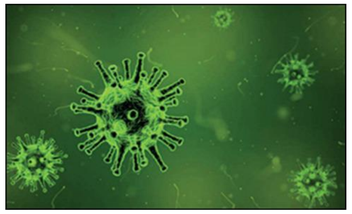
Climate Change and Infectious Disease

Brennan Haggerty, Carsyn Hamstra, Jake Lynott, Taylor McCarthy; Dr. Karie Stamer
Department of Nursing, Northwestern College



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Introduction

The idea of climate change in today's world is one of great interest and concern to many researchers and scientists as the amount of research conducted on this topic is far from sufficient. With this type of research becoming more prevalent in recent years, statistics and studies have shown a significant shift in both regional and global climate variables. Some of the variables impacted include increases in temperature, rising sea levels, greater annual precipitation, and an increase in frequency and intensity of other weather-related events. These climate variables produced changes in the environment that allow for infectious diseases to thrive and spread.

Method

A systematic review was conducted to answer the research question: "What are the impacts of climate change on human health and what role do social determinants contribute to these health outcomes?" A literature search was performed using the online databases EBSCOhost and Worldcat. The articles found were then reviewed and selected to be included within the study if they were published during the period 2016-2021. In order to conduct the search, the keywords utilized were climate change, vector-borne diseases, health, temperature change, and vulnerable populations. The review was specific to studies which examined vector-borne diseases, health outcomes, or potential vulnerable populations which are at increased risk for being affected by climate change. The literature reviewed was restricted to encompass only full-text research articles which were published within scientific journals. Ten articles that fit the search criteria were used for full text review.

Results

The changes in climate promotes the survival and development of different vectors and their hosts of various infectious diseases that do not normally thrive in those areas. For example, ticks are now found at higher latitudes and longitudes, where it was previously too cold or too short for their survival (Vonesch et. al., 2016). During increases in temperature these regions showed evidence that populations were affected by ***Lyme disease*** more frequently the warmer they were (Ebi et al., 2017). While the host factors related to the vulnerability of people may be comparable to different parts of the globe; the environmental factors such as disproportionate increase in temperature, reduced snowfall, extreme weather events such as heavy rainfall, increased agricultural and farming activities, and increased accessibility and mobility of people can be unique variables that impacts the occurrence and growth of different vectors and hosts that are available in certain regions around the world. (Liang & Gong, 2017). A main cause for concern is the potential for ***malaria transmission*** as it is linked to meteorological conditions, such as temperature and precipitation. The vector that causes malaria is the Anopheles mosquito, which was once eliminated from Europe. However, recurrence of this disease has been seen in rural areas of Italy where conditions are favorable, and could see peak expansion by 2030-2050 (Khan et al., 2019). These studies have shown climate changes, such as an increase in temperature and precipitation, have an impact on the occurrence of vector, food, and water borne disease transmission methods. .

Conclusion

Climate change heavily influences infectious disease rates in populations around the world when climate variables fluctuate significantly. Climate change-associated dilemmas such as droughts, floods, heatwaves, fires, water and vector-borne diseases, water scarcity, and shortage of food pose serious threats and will continue to target more vulnerable groups like the poor, children, pregnant women and the elderly. These changes warrant increased awareness within the healthcare field and the need for further research and interventions.

Future Directions

Appropriate measures need to be put in place in order to effectively combat climate change and its effects. Even though the risk for climate related effects in northwest Iowa are low, policy and educational interventions should still be in place to proactively be in front of this issue. Public health promotion interventions such as increased access to healthcare, patient education, and personal protection methods such as bug spray and sunscreen, all contribute to a healthier population. This topic was provided to us by Spencer hospital where we then presented the information to them over zoom.

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