



# Impacts of Climate Change: Communicable Diseases



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## Introduction

Global climate change is resulting in rising temperatures. As temperatures become warmer and more humid, vector borne and water borne diseases that thrive in those conditions, such as Zika Virus, Malaria, Lyme Disease, and Ride Tide, may become more prevalent and Humans may be exposed to more of the vectors and the disease they carry. This poses a threat to public health.

## Zika Virus

Zika is a mosquito carried virus, and mosquitoes are known to thrive in warm, humid environments. Increasing global temperatures is a sign that the population of mosquitoes carrying Zika could increase. Mosquito populations would potentially be spread further due to the growing temperatures caused by climate change.

### Global warming may have expanded the environments mosquitoes can thrive in

First appearance of the "tiger mosquito"



Fig. 1 Source: Vox Science and Health

## Lyme Disease

Lyme disease occurrence is highly seasonal, and cases are mainly reported in the months of June, July, and August. Climate models project a temperature and rainfall increase over the Northeastern U.S. where most Lyme disease cases occur, and suggests that climate change will make environmental conditions suitable for earlier annual onset of Lyme disease cases. Earlier onset of the Lyme disease season was positively associated with warmer and more humid conditions. It is possible that climate change may affect the annual onset of Lyme disease in future decades.

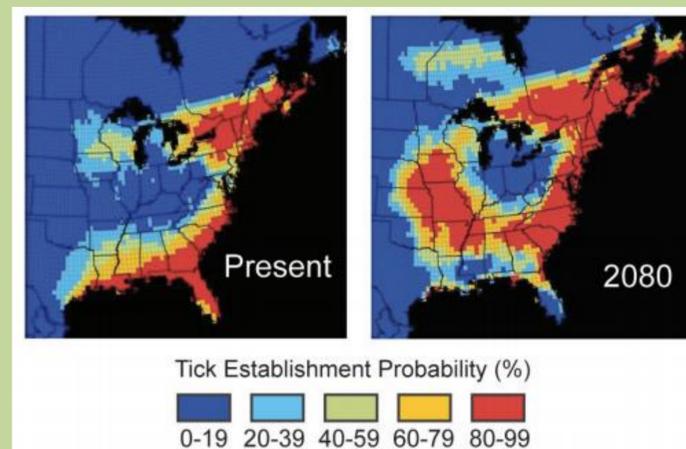


Fig 2. Source: Globalchange.gov

## Red Tide

Changes in specific weather patterns including weather related to the ocean (ex: El Ninos and North Atlantic Oscillation) due to climate change affect the way that plankton and algae grow. This causes shifts and possible problems with events like red tides. In a red tide, a specific type of harmful algae blooms to a great degree, causing the death and illness of sea creatures such as manatees. It also has been known to cause illness in humans living in the area. Shifts in climate are making red tides more likely to happen and make human and sea life sick.

## Bibliography:

- 1 Anonymous. 22 February 2016. "[About Zika Virus Disease](#)". *Center for Disease Control and Prevention*. Accessed 1 April 2016.
- 2 Anonymous. 18 March 2016. "[Zika and Pregnancy](#)". *Center for Disease Control and Prevention*. Accessed 1 April 2016.
- 3 Harvey, C. 21 January 2016. "[How climate change could worsen the spread of Zika virus and other infectious diseases](#)". *Washington Post*. Accessed 28 March 2016.
- 4 Francis, M. 29 June 2015. "Forecasting Malaria in the Age of Climate Change". *Forbes Magazine*. Accessed 29 March 2016.
- 5 Monaghan A.J., S.M. Moore, K.M. Sampson, C.B. Beard, R.J. Eisen. 2015. [Climate Change Influences on the Annual Onset of Lyme Disease in the United States \(Links to an external site.\)](#). *Ticks and Tick-borne Diseases* **6**: 615-622. doi:10.1016/j.ttbdis.2015.05.005
- 6 Hallegraeff, G. M. 2010. OCEAN CLIMATE CHANGE, PHYTOPLANKTON COMMUNITY RESPONSES, AND HARMFUL ALGAL BLOOMS: A FORMIDABLE PREDICTIVE CHALLENGE. *Journal of Phycology* **46**: 220-235.10.1111/j.1529-8817.2010.00815.x.

## Malaria

The virus is transmitted through mosquitoes, and the rise of global temperatures will result in increased spreads of the disease. Studies have been produced in areas of the world that have high rates of malaria among the population; the results showed that places that experience no or varying rates of infections (depending on the amount of rainfall present) increase as the global temperature rises.

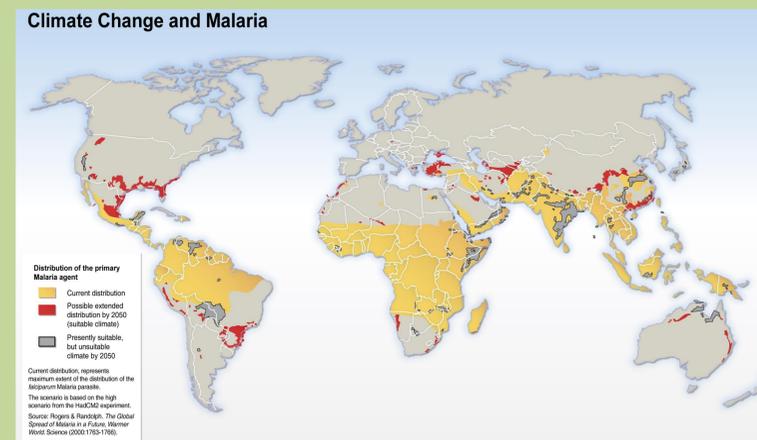


Fig. 3 Source: UCAR Center for Science Education

## Conclusion

Temperature increase due to climate change is one of the main reasons for the increase of populations of vectors (ex: mosquitoes and ticks) which carry disease. Warmer and more humid temperatures, as well as the increased populations of these vectors, will expose humans to a higher risk of catching a vector borne communicable disease.

