NATIONAL CAPITAL REGION
THREAT INTELLIGENCE CONSORTIUM
Intelligence Snapshot

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Climate Change and the Rise in Infectious Disease

How Does Climate Change Affect Infectious Disease Rates?

- Temperature: ***Warming temperatures affect the life-cycle of mosquitoes, enabling a longer breeding season, a broader geographic reach, a higher susceptibility to infectious diseases and, consequently, increased risk of infectious disease transmission to humans.*** The American Society of Tropical Medicine and Hygiene lists this as a concern for the spread of West Nile virus, a mosquito-borne disease that is reported annually in the continental United States including DC, Virginia, and Maryland.

- Rainfall and Flooding: ***Since 1950, the intensity, frequency, and duration of hurricanes, heavy rainfall, and floods, and other extreme weather events related to climate change has increased significantly.*** Flooding moves water contaminated with bacterial pathogens from septic systems, wastewater treatment plants, and animal feeding operations into close proximity with humans. In coastal regions of Maryland, extreme rainfall or flooding even for just one day led to a three percent increase in the regional occurrence of *Campylobacter* infections.

The effects of climate change—in temperature, increased rainfall, and extreme weather events, are contributing to an increase in the occurrence of infectious diseases globally—including West Nile virus, malaria, and dengue virus. Residents in the National Capital Region are advised to monitor for symptoms of common infectious diseases, especially following extreme weather events or travel to regions with a high prevalence of mosquitoes known to carry infectious diseases. According to the CDC, the best way to prevent viruses spread through mosquitoes is to take steps to avoid mosquito bites.

Aedes japonicus japonicus
(Source: ECDC)

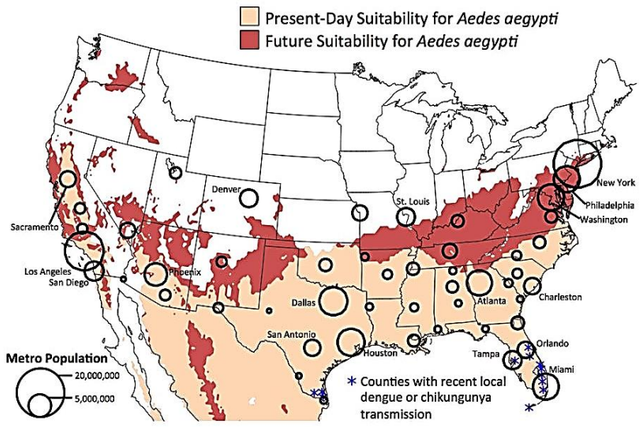
Infectious Disease: ***A 2015 Rutgers University study conducted in Virginia found that populations of the Aedes japonicus japonicus, a disease-carrying mosquito species, are capable of genetic changes during extreme temperature conditions, making them potentially deadlier***. This mosquito is a known carrier of West Nile virus, Japanese encephalitis, La Crosse virus, Rift Valley fever, and dengue virus in laboratory studies, diseases that pose great risk to human health, including death.

Aedes aegypti (Source: ABC)

Aedes albopictus
(Source: Entomology Today)

Infectious Disease: ***Studies show that the Aedes aegypti and Aedes albopictus—species typically found in tropical climates that carry the Zika, dengue, chikungunya viruses, and yellow fever—are likely to migrate and spread to northern climates over the next 30 years, largely due to environmental changes including warmer temperatures.*** The *A. aegypti* will likely reach as far north as Chicago in 2050 and the *A. albopictus* mosquito is also expected to expand in northern regions of the United States. These regions are also expected to see an increase in population growth and this increased concentration will likely create a greater risk for the spread of diseases these mosquitoes transmit.

Visit the DC Department of Health to learn more about mosquitoes and mosquito prevention in DC.



Predicted spread of A. aegypti
(Source: The Conversation)

Common Infectious Diseases & Symptoms

Infectious Disease	Transmission to Humans	Initial Symptoms
West Nile Virus	Infected Mosquito 	Fever, joint pain, body aches, headache, vomiting and diarrhea
Malaria	Infected Mosquito 	Chills, headache, fever, nausea and vomiting
Campylobacteriosis	Bacteria in poultry, raw milk, and untreated water 	Diarrhea, cramping, abdominal pain, fever, nausea and vomiting
La Crosse Virus	Infected Mosquito 	Nausea, vomiting, fever, headache, lethargy, seizures
Dengue Fever	Infected Mosquito 	High fever, severe headache and behind the eyes pain, joint pain, muscle and/or bone pain, rash, mild bleeding, low white cell count
Yellow Fever	Infected Mosquito 	Sudden onset of fever, severe headache, back pain, nausea, vomiting, fatigue and weakness

*Sources available upon request. Please contact the NTIC at ntic@dc.gov.