



VECTOR-BORNE DISEASES AND CLIMATE CHANGE

Summary produced by the Blackfeet Environmental Office
in cooperation with the Center for Large Landscape Conservation

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Vectors are organisms that carry diseases between people and other creatures. Mosquitoes and ticks are two common examples. Animals can also transmit diseases to people either through direct contact, their bodily waste, or by vectors that carry a disease between animals and people.

Climate change is altering the geographic range of vectors, often expanding their range into new locations, and it is also expanding their seasonal ranges, lengthening the time of year that a vector can act to transmit infection. Expanded geographic and seasonal distributions will likely increase risk of disease exposure.

West Nile Virus is a disease transmitted by mosquitoes that may increase in the region. Hotter temperatures and heavy precipitation events can accelerate its transmission. While most people infected with West Nile Virus do not show symptoms, one in five people develop a mild illness called West Nile fever that can last three to six days. One in 150 people can become severely ill with encephalitis or meningitis. The disease is transmitted when mosquitoes bite infected birds and then bite people. Most infections occur between June and September. Preventing mosquito bites is key to staying healthy.



Incidences of **tick-borne diseases** in Montana are relatively rare, averaging only nineteen cases per year, some of which are associated with travel outside the state. However, climate change could increase exposure to ticks and tick-borne diseases in the region. It's important to perform regular tick checks to decrease the risk of tick-borne diseases.



Deer mice (*Peromyscus maniculatus*) can carry viruses that can cause **Hantavirus Pulmonary Syndrome** in people. Climate change may increase rodent populations, indoors and outdoors, especially when periods of heavy rains follow drought and when temperature and rainfall increase. According to the Center for Disease Control (CDC), American Indians account for about 18% of all Hantavirus cases in the United States. Hantavirus is a severe respiratory disease that can be fatal. In the Blackfeet community, we have had several members contract Hantavirus. Anyone who comes into contact with rodents carrying Hantavirus can become infected with Hantavirus Pulmonary Syndrome. Exposure to, or breathing dust after stirring up fresh rodent urine, droppings, and nesting materials of deer mice can infect people with Hantavirus. This process is known as "airborne transmission". Living or working in rodent-infested settings can expose people to Hantavirus. The primary risk for exposure is rodent infestation in and around the home, including cabins, sheds, and outbuildings like barns, garages, and storage buildings. Opening buildings that have been closed for the winter introduces risk as well.



WHO IS MOST AT RISK?

A variety of factors can contribute to vulnerability to vector-borne diseases, and only a few are listed here. Outdoor activity and being close to mosquito or tick habitat can increase risk. For example, living near stagnant water might increase risk of mosquito-borne illnesses. Advanced age and being male are associated with being at higher risk for severe West Nile Virus infections. Occupations like construction, farming, ranching, and pest control work that require people to crawl into spaces that serve as rodent shelter (like under buildings), open dormant buildings or shift wood, lumber, or hay that has been sitting for a while (and that can serve as rodent shelter) could increase risk of Hantavirus. Campers and hikers can also be exposed to Hantavirus if they camp in rodent habitats or use infested trail shelters.

HOW CAN WE ADAPT?

- Wear long pants and socks, use insect repellents, and inspect your skin regularly in the spring and summer months to help prevent tick bites. If a tick is found on the body, follow proper protocol to remove it.
- Follow **the 4 D's** of West Nile Virus prevention to help people avoid exposure. Avoid being outside at **Dawn & Dusk**. Use approved insect repellents (**Deet**) and wear long sleeves and pants (**Dress**) while outdoors to help protect against mosquito bites, and remove standing water near homes (**Drain**) to help decrease the number of mosquitoes near residences.
- Encourage people to use window screens and air conditioning in summer months to help keep mosquitoes out of houses.
- One idea resulting from climate and health discussions was to think about encouraging bat activity near standing water, since bats consume mosquitoes. Building bat houses is one way to invite bats into an area. More investigation is needed, however, since the decision to encourage bat activity would need to be weighed against risks from possible increased exposure to bats. Bats themselves can transmit disease.
- Take precautions to help people avoid Hantavirus. For example, remove outdoor clutter near homes to reduce risks from rodents. Locate woodpiles, lumber, and hay bales far from homes to help reduce rodents sheltering near human residences. Secure holes and gaps in homes to prevent rodents from entering.

Tick Removal Protocol:

1. Use tweezers to grasp tick as close as possible to the skin
2. Pull up with steady, even pressure. Twisting or jerking can cause the mouth-parts to break and remain in the skin.
3. Once the tick is removed, wash the area and your hands with rubbing alcohol or soap and water
4. Dispose of the tick in a safe way – don't crush it with your fingers

If mice droppings or nests are found in the home or outbuildings, follow recommended clean-up procedures on the Center for Disease Control's website.

For more information, visit the Blackfeet Country and Climate Change website:

blackfeetclimatechange.com

Content on this page is summarized from the U.S. Global Change Research Program's report, "The Impacts of Climate Change on Human Health in the United States", the National Institute of Environmental Health Sciences' "A Human Health Perspective on Climate Change", and the Centers for Disease Control and Prevention's "When Every Drop Counts" to briefly describe some of the possible health outcomes that are most relevant to Blackfeet Country. This page does not include all possible health impacts and outcomes, nor does it include all possible risks and responses. It is important to keep in mind that our decisions and actions can influence the degree to which our community will experience these impacts to our health. Being proactive and making decisions now to safeguard health will help us be more resilient. (December, 2017)