



Zoonotic Vector-borne Diseases and Natural Disasters

National Center for Foreign Animal and Zoonotic Disease Defense

- ❑ The term “vector” may describe an animal that can transmit a disease from one living thing to another¹, often by a bite.
 - Rats and mice are common rodent vectors.
 - Mosquitoes, biting flies, fleas and ticks are common insect vectors.
- ❑ “Vector-borne” diseases are those that are passed to humans or animals by vectors.
 - [Malaria](#)² is an example of a vector-borne disease transmitted to humans through mosquito bites.
- ❑ “Zoonotic” diseases are those that are passed from animals to humans or humans to animals.
 - [Rabies](#)³ is an example of a zoonotic disease passed to humans by direct contact with an infected animal, often through a bite.
 - Some examples of zoonotic vector-borne diseases that pass from birds to humans through mosquito bites and occur in various parts of the United States include:
 - [St. Louis encephalitis virus](#)⁴
 - [Eastern equine encephalitis virus](#)⁵
 - [Western equine encephalitis virus](#)⁶
 - [West Nile virus](#)⁷

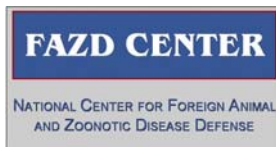
Rodent vectors

It would be understandable to worry that after natural disasters rodents, such as rats and mice, might increase in numbers and act as vectors, posing an increased risk of disease to survivors and response personnel.

- ❑ Rodents are associated with many zoonotic diseases including:
 - [Plague](#)⁸
 - [Salmonellosis](#)⁹
 - [Leptospirosis](#)¹⁰
 - [Rocky Mountain spotted fever](#)¹¹
 - [Tularemia](#)¹²

However, after natural disasters the number of rodent vectors *decreases* as a result of drowning, illness and destruction of their habitats.

- ❑ Populations of rats and mice usually do not begin to increase again until 6 to 10 months after a disaster.¹³
- ❑ Traps and baits commonly sold in grocery, garden and hardware stores, if regularly used according to package directions, can keep household rodent numbers low.
 - This will help decrease a family’s risk of contracting many common vector-borne diseases.



Mosquito vectors

Because mosquito populations *increase* after hurricanes and floods, survivors and response personnel may be concerned that they may more easily become infected with a vector-borne disease.

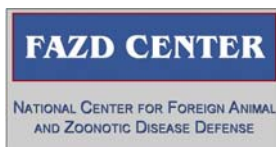
- ❑ Fortunately, an increase in mosquito-transmitted diseases in humans or animals has only occurred *rarely* in the continental United States after recent natural disasters.¹⁴
 - In a 1998 study it was found that after 12 natural disasters from 1975 to 1997, including hurricanes, floods and tropical storms, there was only one disaster that resulted in a significant increase in vector-borne viral disease:
 - The Red River flood of 1975
 - [Western equine encephalitis](#)⁶ was diagnosed in approximately 281 animals and 55 humans.
 - [St. Louis encephalitis](#)⁴ was diagnosed 12 humans.¹⁵
- ❑ However, it was *also* discovered that even though *no significant increase in illness* in people or animals was noted after the other disasters, mosquitoes were frequently shown to be carrying zoonotic diseases such as:
 - [Eastern equine encephalitis](#)⁵
 - [Western equine encephalitis](#)⁶
 - [St. Louis encephalitis](#)⁴
- ❑ Therefore, there was an *increase* in human *risk* of contracting one of these vector-borne diseases due to the increased numbers of mosquito vectors and the fact that people were spending more time outdoors in cleanup and other recovery activities.¹⁴
- ❑ It should also be noted that this study was performed before West Nile virus had spread across the United States.

It is unknown whether the incidence of [West Nile virus](#)⁷ infection will increase along with increasing mosquito numbers after more recent disasters such as Hurricanes Katrina and Rita.

- ❑ The Environmental Protection Agency (EPA) and the Centers for Disease Control recommend that people protect themselves and their families from mosquito bites by using a mosquito repellent,
 - Preferably one that contains DEET (N,N-diethyl-m-toluamide).
 - For further information on the web about how to protect you and your family from [West Nile virus](#)⁷, go to [Fight the Bite!](#)¹⁶
- ❑ It is also recommended to drain even small amounts of standing water from outdoor objects such as old tires, rain gutters, empty flower pots and other objects.^{16;17}
 - Draining water-filled objects will decrease the number of places that mosquitoes can breed, helping to limit vector numbers.

By Dr. Merryman from the Education Section of the National Center for Foreign Animal & Zoonotic Disease Defense.

Contact Donald J. Klingborg DVM, Dale A. Moore DVM, MPVM, PhD, or Marcia Merryman DVM School of Veterinary Medicine, University of California, Davis 530-752-1524



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