

Occupational Hazards of Field Research

All research involves risk. Know the risk and take reasonable precautions. Some level of risk is associated with any activity. This is especially true for activities in remote locations with uncontrolled natural conditions where immediate medical care may be unavailable, where participants may be exposed to physical stressors and disease-bearing organisms.

While working in the field, one is exposed to a different set of “risks” than in an indoor working environment. Most obvious are the risks inherent to being outdoors and possibly far from professional medical help. Field researchers should be fully prepared for the environmental conditions and situations they may encounter. Responsible preparation (adequate clothing, water, and other supplies) is extremely important for changes in weather conditions and other contingencies. An adequate amount of personal medical supplies are also essential (e.g., diabetic supplies, allergic reaction interventions, and other prescribed or over-the counter medications.)

A variety of potentially harmful pathogens including bacteria, parasites, and viruses can survive in natural water sources such as streams, lakes, and rivers. If a treated water source is not available, water should be carried. Never drink from a natural source. If these sources must be used, treat the water first by using water purification tablets, boiling the water for three minutes, or using a special purification filter device.

Safety

Many wild animals are potentially hazardous to research staff, either from traumatic injury, infectious disease, venoms, or poisons. Staff working in the field should maintain current tetanus immunization status, and those working with carnivores or bats should maintain current rabies immunization status. Researchers should ensure that the design of the field study does not compromise the health and safety of the staff working in the field or other animals in the area.

Researchers working with wild animals are at risk for traumatic injury due to direct animal contact, or for infectious disease transmitted by the animals or their parasites. The risk of injury or illness can be reduced by using appropriate handling techniques, personal protective equipment, and good personal hygiene. The risk of bites or scratches can be reduced by wearing leather or fabric gloves. Exposure to blood or other body fluids and feces may be minimized by wearing latex gloves and avoiding needle punctures when using syringes or other sharp instruments.

Animals often serve as reservoirs for zoonotic disease agents. Human infection with some of these zoonotic agents can lead to serious illness or death. Zoonotic diseases can be transmitted through direct contact with infected animals or their body fluids and feces. Transmission of some zoonotic disease agents occurs through the inhalation of aerosolized urine or feces contaminated with the infected agent.

Many zoonotic diseases may be transmitted between species by arthropod vectors such as ticks, fleas and mosquitoes. Direct contact with the infected animal is not necessary to acquire infection. Researchers should be aware of what diseases occur in the geographic area they are working in and take appropriate precautions to avoid exposure.

TETANUS

Tetanus (lockjaw) is an acute, often fatal disease caused by the toxin of the tetanus bacillus, *Clostridium tetani*.



The bacterium usually enters the body in the spore form, often through a puncture wound contaminated with soil, dust, or animal feces, or through lacerations, burns, and minor unnoticed wounds. The organism is commonly found in the intestines of animals where it causes no negative effects. Humans infected through a wound or lesion frequently develop muscle rigidity and painful muscular contractions. Infection may be fatal.

All employees working with animals should be immunized against tetanus at least every ten years. All animal bite or scratch wounds should be thoroughly cleansed and evaluated by a physician.

Additional information regarding the treatment of animal bite wounds can be found at [Bite Scratch Protocol](#) or by calling ULAM 734-764-0277.

Additional information regarding tetanus can be found on the [CDC Website](#).

TICKBORNE ILLNESS

Protective clothing and insect repellent is recommended, especially during seasons when ticks are active. To prevent tick bites, wear full-length pants and long-sleeved shirts when outdoors in tick-infested areas. Shirts should be tucked into pants, and pant legs into boots or socks. When returning from the field, a thorough check of the body should be performed to assure that no ticks remain.

Lyme disease is spread by the bite of an infected tick. Symptoms appear from three days to one month after tick exposure and include a red macule at the bite, joint pain, fever, chills, headache, and malaise. Untreated Lyme disease can appear to go away, only to return in more serious form later. Secondary stages can include heart complications and meningitis-like symptoms. Months or years later, arthritis can appear, and the later stages can involve chronic neurological manifestations.

Rocky Mountain Spotted Fever is a tick borne febrile illness commonly characterized by acute onset and usually accompanied by malaise, myalgia, headache, nausea, and petechial rash. This rash is present in 2/3 of cases and appears as small red spots or blotches that begin on the wrist, ankles, palms, and soles; it spreads up the arms and legs toward the trunk. Symptoms begin 3- 12 days after tick exposure. Once symptoms develop, death can occur within two weeks without proper treatment.

Tularemia is a rare infection caused by the bacteria *Francisella tularensis*, which is widely distributed in nature. This bacterium resides in many animal species and is transmitted by direct contact, or by a bite from a tick or deer fly. The illness can also be contracted through direct contact with an infected animal carcass, especially rabbits. The symptoms of tularemia include an ulcerative lesion at the site of inoculation or contact, regional lymph node swelling, pneumonia, fever and chills, headache, muscle pain and joint stiffness. Additional information regarding tickborne illnesses can be found on the [CDC Website](#).

RABIES

Bats, raccoons, skunks, foxes, and coyotes are the mammals most often infected with rabies. Rabies postexposure prophylaxis is recommended for all persons with bite, scratch, or mucous membrane exposures to such wildlife. Postexposure prophylaxis should be initiated as soon as possible after personnel are exposed. Postexposure prophylaxis might be appropriate even if a bite, scratch, or mucous membrane exposure is not apparent when there is reasonable probability that such exposure might have occurred. Preexposure vaccination should be considered for persons whose activities bring them into frequent contact with potentially rabid bats, raccoons, skunks, or other species at risk for having rabies. These animals should never be handled by untrained and unvaccinated personnel.

Rabies is transmitted only when the virus is introduced into bite wounds or open cuts in skin or onto mucous



membranes. Immediate and thorough washing of all bite wounds and scratches with soap and water and a virucidal agent such as povidone-iodone solution irrigation are important measures for preventing rabies.

Small rodents and lagomorphs (e.g., rabbits and hares) are almost never found to be infected with rabies and have not been known to transmit rabies to humans.

If a person is bitten by an animal with unknown vaccination status, the person should immediately clean the wound and seek medical attention. Additional information regarding rabies can be found on the [CDC Website](#).

WEST NILE VIRUS

For young and healthy researchers who are not immunocompromised, West Nile Virus (WNV) is unlikely to cause much more than a mild illness – typically “flu-like symptoms.” A more serious case of WNV in humans results in fever, disorientation, muscle weakness, neck stiffness, headache, and nausea. Persons over 50 years of age are at an increased risk of severe disease.

According to the Centers for Disease Control:

- Most people (8 out of 10) infected with West Nile virus do not develop any symptoms
- About 1 in 5 people who are infected develop a fever with other symptoms such as headache, body aches, joint pains, vomiting, diarrhea, or rash. Most people with this type of West Nile virus disease recover completely, but fatigue and weakness can last for weeks or months.
- About 1 of each 150 infected persons becomes seriously ill with central nervous system infection (encephalitis and/or meningitis)

Additional information regarding West Nile Virus can be found on the [CDC Website](#).

LEPTOSPIROSIS

Leptospirosis is caused by exposure to urine of infected animals, or water, food, or soil containing urine from infected animals. Symptoms of leptospirosis include high fever, severe headache, chills, muscle aches, and vomiting, and may include jaundice (yellow skin and eyes), red eyes, abdominal pain, diarrhea, or a rash. If the disease is not treated, kidney damage, meningitis, liver failure, and respiratory distress may develop, in rare cases death occurs.

Additional information regarding Leptospirosis can be found on the [CDC Website](#).

If you have had an exposure, illness symptoms, and need medical attention please refer to the information in the Bite Scratch Protocol.

References

- [Merck Veterinary Manual](#)
- [CDC Wildlife](#)
- [CDC Zoonotic Diseases](#)