

Field Research Appendices B-L, Hazards

Appendix B — General physical and environmental hazards

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Vehicle Accident	Worldwide	<ul style="list-style-type: none"> • Fatigue. • Impaired driving. • Driver error. • Roadway factors. • Vehicle factors. 	<ul style="list-style-type: none"> • Various trauma injuries. 	<ul style="list-style-type: none"> • Call 911. • Secure the scene. • Do not move victim. • Check airways, breathing and circulation. • Treat specific injury. 	<ul style="list-style-type: none"> • Obey traffic laws. • Wear your seatbelt. • Don't drive impaired. • Don't speed or drive recklessly. • Don't use a 12-or-15 passenger van.
Slips, trips falls	Worldwide	<ul style="list-style-type: none"> • Loose, irregular, or slippery surface. • Wrong footwear. • Poor lighting. • Obstruction. • Improper, or lack of, use of ladders. • Inattention or distraction. 	<ul style="list-style-type: none"> • Strains, fractures, bruises, and contusions like head, wrist, elbow, shoulder, back, hip, knee, ankle. 		<ul style="list-style-type: none"> • Proper housekeeping. • Wear proper footwear. • Adequate lighting. • Don't carry oversized objects. • Use ladders properly.

Dehydration	Worldwide	Not enough water intake.	<ul style="list-style-type: none">• Increased thirst.• Dry mouth.• Flushed face.• Dizziness.• Headache.• Weakness.• Muscle cramps.	<ul style="list-style-type: none">• Drink plenty of fluids.• Take frequent rest breaks.• Minimize caffeinated beverage intake.	<ul style="list-style-type: none">• Drink plenty of water, at least 2 quarts per day, and more if working strenuously or in a warm climate.
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Hazard	Location	Cause	Symptoms	First Aid	Prevention
			<ul style="list-style-type: none"> • Dark urine. 		
Impure Water	Worldwide	Harmful organisms and pathogens living in water sources.	<ul style="list-style-type: none"> • Gastrointestinal illness. • Flu-like symptoms. 	<ul style="list-style-type: none"> • Drink clear liquids that are uncontaminated. • Slowly introduce mild foods, e.g., rice, toast, crackers, bananas, or applesauce • See a doctor if there is no improvement. 	<ul style="list-style-type: none"> • Carry your own water. • Treat water before use with tablets, purifiers, or by boiling for > 3 minutes. • Use.
Sunburn	Worldwide	Excessive exposure to the sun.	<ul style="list-style-type: none"> • Irritated skin, pink or red in color. 	Apply cool water, aloe, or other cooling lotion to affected area.	<ul style="list-style-type: none"> • Wear long-sleeved clothing and a hat. • Apply SPF ≥ 30 sunblock.
Heat Exhaustion	Worldwide — hot climates	Prolonged physical exertion in a hot environment.	<ul style="list-style-type: none"> • Fatigue. • Excessive thirst. • Heavy sweating. • Cool, clammy skin. 	Cool the victim, treat for shock, and slowly give water or electrolyte replacer.	<ul style="list-style-type: none"> • Acclimate to heat gradually. • Drink plenty of liquids. • Take frequent rest breaks.
Heat Stroke	Worldwide — hot climates	Prolonged physical exertion in a hot environment.	<ul style="list-style-type: none"> • Exhaustion. • Light-headedness. • Bright red warm skin. 	Cool the victim at once, replenish fluids, and seek medical attention immediately.	<ul style="list-style-type: none"> • Acclimate to heat gradually. • Drink plenty of liquids. • Take frequent rest breaks.

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Frostbite	Worldwide — cold climates	Exposure to cold temperatures.	<ul style="list-style-type: none"> • Waxy, whitish numb skin. • Swelling, itching, burning, and deep pain as the skin warms. 	Slowly warm the affected areas. Do <u>not</u> rub area and seek medical attention immediately.	<ul style="list-style-type: none"> • Dress in layers. • Cover your extremities with warm clothing, e.g., hats, facemask, gloves, socks, and shoes.
Sandstorms/ Haboob	Worldwide — Arid climates	Thunderstorm outflow winds.			<ul style="list-style-type: none"> • If dense dust is observed blowing across or approaching a roadway, pull your vehicle off the pavement as far as possible, stop, turn off lights, set the emergency brake, take your foot off of the brake pedal to be sure the taillights are not illuminated. • Don't enter the dust storm area if you can avoid it. • If you can't pull off the roadway, proceed at speed suitable for visibility, turn on lights and sound horn occasionally. Use the painted center line to help guide you. Look for

Hazard	Location	Cause	Symptoms	First Aid	Prevention
					<p>a safe place to pull off the roadway.</p> <ul style="list-style-type: none"> • Never stop on the traveled portion of the roadway.
Flash flooding/ Mudslides/ landslides	Worldwide	Many factors, e.g., earthquakes, storms, volcanic eruptions, fire and human modification of land.			<ul style="list-style-type: none"> • Listen to local news stations for warnings • Heed all warnings and evacuation notices. • Stay alert and awake during a storm that could cause a landslide. • Never cross a road with flowing water or mud. • Never cross a bridge if you see a flow approaching. • Avoid river valleys and low-lying areas during times of danger. • If you get stuck in the path of a landslide, move uphill as quickly as possible. • If near a stream or channel, be alert for any sudden increase or decrease in water flow or water that changes from clear to muddy.

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Hypothermia	Worldwide — cold climates	Prolonged exposure to cold temperatures.	<ul style="list-style-type: none"> • Shivering. • Numbness. • Slurred speech. • Excessive fatigue. 	Remove cold, wet clothes, put on dry clothes, or use a blanket or skin-to-skin contact, drink warm liquids, seek medical attention immediately.	<ul style="list-style-type: none"> • Dress in layers. • Wear appropriate clothing. • Avoid getting damp from perspiration.
Carbon Monoxide	Worldwide	Running a vehicle or burning a fuel stove in an enclosed space.	<ul style="list-style-type: none"> • Severe headaches. • Disorientation. • Agitation. • Lethargy. • Stupor. • Coma. 	Remove the victim to fresh air immediately and perform CPR if needed	<ul style="list-style-type: none"> • Keep areas adequately ventilated when burning fuel. • Ensure that vehicle tailpipe is not covered by snow.
Extreme Weather	Worldwide	Snow squalls, blizzards, heavy rains, lightning, tornadoes, hurricanes.	<ul style="list-style-type: none"> • Severe weather can result in physical injury and/or death. 	Seek shelter immediately.	<ul style="list-style-type: none"> • Be aware of special weather concerns. • Bring appropriate equipment to deal with severe weather.
High Altitude Illness	Worldwide — high altitudes	Decreased oxygen intake and increased breathing rate.	<ul style="list-style-type: none"> • Headache. • Nausea. • Weakness. 	Use supplemental oxygen and decrease altitude.	<ul style="list-style-type: none"> • Allow your body to acclimatize by gaining elevation slowly.

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Wildfire	Worldwide	Unplanned fires that burn in natural areas like forests, grasslands or prairies. Spread quickly to other natural areas and communities.			<ul style="list-style-type: none"> • Pay attention to emergency alerts and notifications for information and instructions. • Evacuate immediately if authorities tell you to do so. • If trapped, call emergency services and give your location. Turn on lights to help rescuers find you. • Use an N95 mask to protect yourself from smoke inhalation or limit your exposure to smoke. • If sick or need medical attention, contact a healthcare provider for further care instructions and shelter in place, if possible.

Appendix C — Hazards in North America

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Hunting Season	U.S.	Local hunting seasons and regulations vary.	<ul style="list-style-type: none"> • A hunting accident may result in serious injury or death. 	Seek medical attention for serious injuries or wounds.	<ul style="list-style-type: none"> • Wear appropriately colored safety clothing. • Avoid animal-like behavior, like hiding in thickets.
Poison Plants	North America	Exposure to poison ivy, poison oak, or poison sumac plants.	<ul style="list-style-type: none"> • Itchy rash. • Red, swollen skin. 	Apply a wet compress with baking soda or vinegar, or use a topical ointment. Avoid scratching the rash.	<ul style="list-style-type: none"> • Avoid contact with poison plants. • Use pre-exposure lotion. • Wash clothes and skin with soap and water after exposure.

Appendix D — International hazards

Hazard	Location	What to do if encountered	Prevention
Violence caused by political unrest or military conflict	International	Leave the area as soon as it is safe to do so.	<ul style="list-style-type: none"> • Be aware of current travel advisories. See Section VI.
Theft	International	Report theft immediately to local authorities.	<ul style="list-style-type: none"> • Keep wallet in front pocket. • Carry shoulder bag diagonally and keep bag in front under your arm.

Appendix E — Animals and pests general

Type	Location	Most dangerous Species	What to do if encountered	First Aid	Prevention
Mosquitoes	Worldwide – especially wet areas conducive to breeding	Refer to Section V: Diseases		Use topical ointment to relieve itching.	<ul style="list-style-type: none"> • Use insect repellent. • Don't leave standing pools of water. • Use bed nets.
Rodents	Worldwide		Do not touch a rodent, dead or alive.	Clean wounds thoroughly if bitten or scratched.	<ul style="list-style-type: none"> • Keep areas clean to avoid attracting rodents. • Store food in sealed containers.
Conenose “Kissing” Bugs	North and South America	May cause allergies in some people. In Latin America, they sometimes carry a protozoan, <i>Trypanosoma cruzi</i> , which causes Chagas' disease Refer to Section V: Diseases.		Use topical ointments to soothe itching. Seek medical attention immediately in case of anaphylactic shock.	<ul style="list-style-type: none"> • Use caution when working near nests and wood rat dens. • Use extra caution when working near rock shelters.
Sharks	Worldwide — Oceans: U.S., Africa, Central and South America, Australia, Pacific Islands	Great White, Bull, Tiger, Oceanic Whitetip	Call for help, swim towards safety, punch or kick the shark if necessary.	Seek medical attention for serious injuries or wounds.	<ul style="list-style-type: none"> • Never swim alone. • Don't wear sparkling jewelry. • Don't enter the water when bleeding.

Type	Location	Most dangerous Species	What to do if encountered	First Aid	Prevention
Crocodiles and Alligators	Worldwide — Tropics and subtropics: North America, Australia, Africa, Eastern China	American Alligator in North America, Estuarine Crocodile in Australia, Nile Crocodile in Africa	Do not provoke an alligator or crocodile.	Seek medical attention for serious injuries or wounds.	<ul style="list-style-type: none"> • Avoid waters known to be home to crocodiles or alligators. • Keep at least 30 feet away from any crocodile or alligator.

Appendix F — Animals and pests North America

Type	Location	Most dangerous species	What to do if encountered	First Aid	Prevention
Bears	North America	Black Bear in North America, Grizzly Bear in Alaska, Western Canada and Pacific Northwest, Polar Bear in the Arctic	<ul style="list-style-type: none"> • Do not run. • Move slowly and speak in a low soft voice. • If attacked, lay in the fetal position, and protect the head. • Play dead. 	Seek medical attention immediately for serious injuries or wounds.	<ul style="list-style-type: none"> • Keep food out of sleeping areas. • Never approach a bear or bear cub. • Wear a bell or other noisemaker. • Stay away from the bear's food supply.
Mountain Lions	North, Central, and South America	All	<ul style="list-style-type: none"> • Do not run, back away slowly, do not corner it. • Do not play dead; look it in the eyes. • Make yourself look larger with arms overhead, do not bend down. • Use a loud voice. • Throw sticks or rocks. • Fight back, poke it in the eye with your thumb. 	Seek medical attention immediately for serious injuries or wounds.	<ul style="list-style-type: none"> • Do not leave children or pets unattended. • Do not feed deer. • Avoid hiking, biking, jogging alone or other outdoor activities when mountain lions are most active, dawn, dusk and at night. • Avoid walking near dense growth, rock outcroppings, ledges. • Always look up and behind you. • Carry pepper spray.

Type	Location	Most dangerous species	What to do if encountered	First Aid	Prevention
			<ul style="list-style-type: none"> Protect your neck and head. 		
Snakes	North America, Mexico	Rattlesnakes, Cottonmouths, Coral Snakes, Moccasins, and Copperheads	<ul style="list-style-type: none"> Do not pick up, disturb, or corner it. Move away from the snake. Avoid locations where snakes may be. 	<ul style="list-style-type: none"> Let the wound bleed freely for 30 seconds. Apply a cold pack. Keep area immobilized at heart level. Seek medical attention immediately. Alert ahead if possible. 	<ul style="list-style-type: none"> Walk in open areas. Wear heavy boots. Use a stick to disturb the brush in front of you.
Spiders	North America	Black Widow and Brown Recluse	<ul style="list-style-type: none"> Do not pick up or disturb a spider. Avoid locations where spiders may be, such as dark places. 	<ul style="list-style-type: none"> Clean wound. Apply a cold pack. Keep area immobilized at heart level. Seek medical attention immediately. Alert ahead if possible. 	<ul style="list-style-type: none"> Use care around rock piles, logs, bark, gardens, outdoor privies, old buildings. Wear gloves when working outside. Shake out clothing and bedding before use.
Scorpions	North America — especially Arizona, Southeast	All	<ul style="list-style-type: none"> Do not pick up or disturb a scorpion. 	<ul style="list-style-type: none"> Clean wound. Apply a cold pack. 	<ul style="list-style-type: none"> Shake out clothing and bedding before use.

Type	Location	Most dangerous species	What to do if encountered	First Aid	Prevention
	California, Utah, and Mexico		<ul style="list-style-type: none"> Avoid locations where scorpions may be. 	<ul style="list-style-type: none"> Keep area immobilized at heart level. If needed, use painkiller or antihistamine. Seek medical attention if no signs of improvement. 	<ul style="list-style-type: none"> Avoid lumber piles and old tree stumps. Wear gloves when working outside.
Bees, Wasps, etc.	North America	Bees, wasps, hornets and yellowjackets, Africanized Killer Bees in Southeast U.S.	<ul style="list-style-type: none"> Avoid wearing bright colors, flower prints and perfume. Move slowly or stand still. Don't swat at insects. 	<ul style="list-style-type: none"> Remove the stinger. Apply a cold pack. Keep area immobilized at heart level. If needed use painkiller or antihistamine. 	<ul style="list-style-type: none"> Bring medication if you have an allergy, as the sting may be fatal. Keep scented foods, drinks and meats covered. Wear shoes outside.

Fleas and Ticks	North America	Refer to Section V: Diseases	<ul style="list-style-type: none">• Avoid shrubbery.• Stay on widest part of path.	<ul style="list-style-type: none">• Remove the flea or tick with tissue or tweezers.• Clean wound with antiseptic.• Pay attention for signs of illness. See Section V: Diseases and seek medical	<ul style="list-style-type: none">• Wear long clothing with tightly woven material.• Wear insect repellent.• Tuck pants into boots.• Drag cloth across the campsite to check for fleas/ticks.• Protect pets.
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Appendix G - Animals and pests international

Type	Location	Most dangerous species	What to do if encountered	First Aid	Prevention
Bears	Worldwide: Arctic, South America, Asia	Polar Bears in Greenland and North Russia, Spectacled Bears in North and West South America, Asiatic Black Bears in South and East Asia	<ul style="list-style-type: none"> • Do not run. • Move slowly and speak in a low soft voice. • If attacked, lay in the fetal position, and protect the head. • Play dead. 	Seek medical attention immediately for serious injuries or wounds	<ul style="list-style-type: none"> • Keep your camp area free of garbage and food waste. • Never feed or approach a bear, especially a cub. • Stay away from the bear's food.
Lions	Africa and Asia	All	<ul style="list-style-type: none"> • Do not startle. • Do not run. • Do not look it in the eye. • Make yourself look larger. 	Seek medical attention immediately for serious injuries or wounds	<ul style="list-style-type: none"> • Stay inside the vehicle if traveling near lions. • Do not camp in areas frequented by lions. • Do not sleep outside. • Do not provoke.
Other Large Land Dwellers	Africa, Asia	Hippos, African Elephant, Rhinos, and Buffalo in Africa; Asian Elephants and Bengal Tigers in Southeast Asia; Siberian Tigers in North and East Asia	<ul style="list-style-type: none"> • Do not startle. 	Seek medical attention immediately for serious injuries or wounds	<ul style="list-style-type: none"> • Stay inside the vehicle if traveling near large animals. • Do not camp near areas frequented by large animals. • Keep a lookout in open spaces. • Do not provoke.

Water Dwellers	Worldwide — especially in Australia	Blue Ringed Octopus, Box Jellyfish, and Irukandji Jellyfish in Australia; Stonefish located worldwide	Never touch an unidentified octopus or jellyfish	<ul style="list-style-type: none"> • Jellyfish/Octopus sting use vinegar on wound. • Stonefish sting rinse with warm water. • Seek medical attention. 	<ul style="list-style-type: none"> • Avoid going in waters known to be inhabited by jellyfish and octopuses. • Wear sandals in the water to avoid stepping on a stonefish.
Snakes	Worldwide	Russel's Viper, Indian Cobra in India; Tiger, Black, Brown, Sea Snakes in Australia; Egyptian Cobra, Puff Adder, Saw Scaled Viper in Africa; Fer-de-lance in Central and South America	<ul style="list-style-type: none"> • Do not pick up, disturb or corner a snake. • Move away from the snake. 	<ul style="list-style-type: none"> • Let the wound bleed freely for 30 seconds. • Apply a cold pack. • Keep area immobilized at heart level. • Bring victim to hospital and alert ahead if possible. 	<ul style="list-style-type: none"> • Walk in open areas. • Wear heavy boots. • Use a stick to disturb the brush in front of you.
Spiders	Worldwide	Funnel Web and Redback Spiders in Australia; Brazilian Wandering Spider, Brown Recluse, and Tarantula in South America	<ul style="list-style-type: none"> • Do not pick up or disturb a spider. • Avoid locations where spiders might be, such as dark places. 	<ul style="list-style-type: none"> • Clean wound. • Apply a cold pack. • Keep area immobilized at heart level. • Bring victim to hospital and alert ahead if possible. • Kill spider for a positive ID. 	<ul style="list-style-type: none"> • Use care around rock piles, logs, bark, outdoor privies, and old buildings. • Shake out clothing and bedding before use. • Wear shoes outside. • Wear gloves when working outside.

Scorpions	Worldwide — especially North Africa, The Middle East, South America, and India	All	<ul style="list-style-type: none">• Do not pick up or disturb a scorpion.• Avoid locations where scorpions may be.	<ul style="list-style-type: none">• Clean wound.• Apply a cold pack.• Keep area immobilized at heart level.• Use painkiller or antihistamine if desired.• Seek medical attention if no improvement.	<ul style="list-style-type: none">• Shake out clothing and bedding before use.• Avoid lumber piles and old tree stumps.• Wear gloves when working outside.
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Appendix H — Diseases general

Type	Location	Exposure route	Symptoms	First Aid	Prevention
Campylobacteriosis	Worldwide	Foodborne — poultry products, unpasteurized milk or water contaminated with <i>Campylobacter</i> .	<ul style="list-style-type: none"> • Diarrhea. • Gastrointestinal symptoms. • Fever. 	<ul style="list-style-type: none"> • Drink plenty of fluids. • Seek medical attention if symptoms persist. 	<ul style="list-style-type: none"> • Always cook food thoroughly. • Never drink water from an impure source. • Do not drink unpasteurized milk. • Wash hands with soap and water frequently.
Cholera	Africa, Asia, Latin America	Foodborne — food and water contaminated with <i>Vibrio cholerae</i> .	<ul style="list-style-type: none"> • Diarrhea. • Gastrointestinal symptoms. 	<ul style="list-style-type: none"> • Drink plenty of fluids. • Seek medical attention if symptoms persist. 	<ul style="list-style-type: none"> • Always cook food thoroughly. • Never drink water from an impure source. • Wash hands with soap and water frequently.
<i>E. coli</i> O157:H7 and Shiga toxin-producing <i>E. coli</i> Gastroenteritis	Worldwide	Foodborne — beef, unpasteurized milk, unwashed raw vegetables, water contaminated with <i>Escherichia coli</i> .	<ul style="list-style-type: none"> • Diarrhea. • Gastrointestinal symptoms. 	<ul style="list-style-type: none"> • Drink plenty of fluids. • Seek medical attention if symptoms persist. 	<ul style="list-style-type: none"> • Always cook food thoroughly. • Wash vegetables before consuming. • Never drink water from an impure source. • Wash hands with soap and water frequently.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
Hepatitis A — Vaccine available	Worldwide in under- developed countries	Foodborne — water, shellfish, unwashed raw vegetables contaminated with Hepatitis A virus	<ul style="list-style-type: none"> • Diarrhea. • Gastrointestinal symptoms. 	<ul style="list-style-type: none"> • Drink plenty of fluids from bottled or purified water — not local water. • Seek medical attention if symptoms persist. 	<ul style="list-style-type: none"> • Obtain a vaccine. • Always cook food thoroughly. • Wash vegetables before consuming. • Never drink water from an impure source. • Wash hands with soap and water frequently.
Histoplasmosis	Worldwide — especially Mississippi and Ohio River Valleys	Inhalation of fungus <i>Histoplasma capsulatum</i> from soil contaminated with bat or bird droppings.	<ul style="list-style-type: none"> • Mild, flu-like. • Rarely can be acute pulmonary histoplasmosis. 	<ul style="list-style-type: none"> • See a doctor if you suspect histoplasmosis • Typically clears up in three weeks. 	<ul style="list-style-type: none"> • Use caution when disturbing dry soils or working near bat or bird droppings. • Personal protective equipment may be needed.
Human Immuno- deficiency virus/ Acquired Immune Deficiency Syndrome — HIV/AIDS	Worldwide	<ul style="list-style-type: none"> • Being exposed to blood or body fluids infected with HIV. • Having sex or sharing needles with someone infected with HIV. 	<ul style="list-style-type: none"> • May have flu-like symptoms 14–60 days post-infection. • Attacks the immune system, may eventually result in opportunistic infections or cancers. 	<ul style="list-style-type: none"> • None. • Blood test for diagnosis. • Treatment with antiretroviral drugs for long-term maintenance. 	<ul style="list-style-type: none"> • Follow Bloodborne Pathogen training when handling any unfixed human blood or tissue. • Do not engage in risky activities.
Influenza — seasonal	Worldwide	<ul style="list-style-type: none"> • Inhalation of influenza virus. 	<ul style="list-style-type: none"> • Fever. • Headache. 	<ul style="list-style-type: none"> • Flu antiviral drugs can treat the flu 	<ul style="list-style-type: none"> • Annual flu vaccination.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
	Note: As of 2008, pandemic strains of non-seasonal influenza have been reported in Africa, Asia, Europe, Near East and occur primarily in birds	<ul style="list-style-type: none"> Contact with birds infected with influenza. 	<ul style="list-style-type: none"> Extreme tiredness. Dry cough. Sore throat. Runny or stuffy nose. Muscle aches. Stomach symptoms like nausea, vomiting and diarrhea are more common in children. 	<p>or prevent infection.</p> <ul style="list-style-type: none"> Your health care professional will decide whether you should take antiviral drugs. Antiviral drugs should be started within 48 hours of getting sick. Antiviral drugs are 70–90% effective in preventing infection. 	<ul style="list-style-type: none"> Cover your nose and mouth with a tissue or elbow when you cough or sneeze. Wash hands with soap and water frequently. If you are not near water, use an alcohol-based hand cleaner. Try not to touch your eyes, nose or mouth. Stay away from people who are sick. If you get the flu, stay home from work or school.
Leptospirosis	Worldwide	Ingestion, swimming, or other activities in water contaminated with <i>Leptospira</i> .	<ul style="list-style-type: none"> Flu-like. Occasionally more serious symptoms. 	<ul style="list-style-type: none"> See a doctor if you suspect leptospirosis. 	<ul style="list-style-type: none"> Use care when working in the water, especially after a flooding event. Avoid entering the water with open wounds.
Norovirus “Norwalk-like viruses” Gastroenteritis	Worldwide	<ul style="list-style-type: none"> Foodborne — food, water, surfaces or objects contaminated with Norovirus. 	<p>Nausea, vomiting, diarrhea, stomach cramping.</p> <p>Some people also have a low-grade fever, chills,</p>	Stay hydrated	<ul style="list-style-type: none"> Wash hands with soap and water frequently. Wash fruits/vegetables and steam oysters.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
		<ul style="list-style-type: none"> • Direct contact with another person who is infected. 	headache, muscle aches, malaise.		<ul style="list-style-type: none"> • Clean and disinfect contaminated surfaces immediately after illness using a bleach-based cleaner. • Remove and wash contaminated clothing or linens.
Plague	Worldwide	<ul style="list-style-type: none"> • Flea-borne — from rodents infected with <i>Yersinia pestis</i> to humans. • Direct contact with infected tissues or fluids from sick or dead animals. 	<ul style="list-style-type: none"> • Flu-like. • Non-specific. • Swollen and painful lymph nodes — bubonic. 	See a doctor if you suspect plague.	<ul style="list-style-type: none"> • Use care when working in areas where plague is found. • Use caution when working with wild rodents.
Rabies — Vaccine available	Worldwide	<ul style="list-style-type: none"> • Infection from the bite of an animal like raccoons, skunks, bats, foxes, coyotes, dogs, cats infected with <i>Lyssavirus</i>. • Bat bites are difficult to see and may not be felt. Exposure is also possible when a bat is found in 	<ul style="list-style-type: none"> • Fatal within days of the onset of symptoms without immediate treatment. • Early symptoms: fever, headache, malaise. • Later symptoms: insomnia, anxiety, confusion, paralysis, hallucinations, 	Disinfect and wash the wound. See a doctor immediately if potentially exposed to a rabies-carrying species like a bat or carnivore.	<ul style="list-style-type: none"> • Obtain a vaccine if you will be working with bats or carnivores. • Use extreme caution handling these animals. • Vaccinate pets.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
		living or sleeping quarters.	hypersalivation, difficulty swallowing, fear of water.		
Salmonellosis	Worldwide	Foodborne: beef, poultry, milk, eggs, unwashed raw vegetables contaminated with salmonella bacteria	<ul style="list-style-type: none"> • Diarrhea. • Gastrointestinal symptoms. 	<ul style="list-style-type: none"> • Drink plenty of fluids. • Seek medical attention if symptoms persist. 	<ul style="list-style-type: none"> • Always cook food thoroughly. • Wash vegetables before consuming. • Wash hands with soap and water frequently.
Typhoid Fever —Vaccine available	Worldwide	Foodborne: food and water contaminated with <i>Salmonella typhi</i> .	<ul style="list-style-type: none"> • Diarrhea. • Gastrointestinal symptoms. 	<ul style="list-style-type: none"> • Drink plenty of fluids. • Seek medical attention if symptoms persist. 	<ul style="list-style-type: none"> • Obtain a vaccine. • Always cook food thoroughly. • Never drink water from an impure source. • Wash hands with soap and water frequently.
Tetanus — Vaccine available	Worldwide	A wound that is infected with <i>Clostridium tetani</i> ; tetanus toxin is produced by the bacteria and attacks nerves.	<ul style="list-style-type: none"> • Early symptoms: lockjaw, stiffness in the neck and abdomen, difficulty swallowing. • Later symptoms: muscle spasms, seizures, nervous system disorders. 	<ul style="list-style-type: none"> • See a doctor for any wound contaminated with dirt, feces, soil, or saliva; for puncture wounds; and for wounds resulting from crushing, burns, and frostbite. 	<ul style="list-style-type: none"> • Obtain a vaccine for tetanus every 10 years or immediately following a suspect wound or injury. • Once the disease starts, it must run its course.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
Typhus Fever	Worldwide	Infection from the bite of lice, fleas, ticks, or mites infected with <i>Rickettsiae</i> species.	<ul style="list-style-type: none">• Headache.• Fever.• Rash.	<ul style="list-style-type: none">• See a doctor if you suspect Typhus Fever.• Treatable with antibiotics.	<ul style="list-style-type: none">• Use insect repellent.• Wear long-sleeve shirts.• Tuck pants into boots.

Appendix I — Diseases North America

Type	Location	Exposure route	Symptoms	First Aid	Prevention
Coccidiomycosis — Valley Fever	North and South America semiarid regions	<i>Coccidioides</i> species fungus is inhaled when soil is disturbed.	<ul style="list-style-type: none"> • None in most people ~60%. • Flu-like: fever, cough, rash, headache, muscle aches. • Occasionally, chronic pulmonary infection or widespread disseminated infection like skin lesions, central nervous system infection, and bone and joint infection. 	See a doctor if you suspect Valley Fever.	<ul style="list-style-type: none"> • Wet soil before digging. • If you are immunocompromised, wear a mask when digging. • Stay inside during dust storms in areas where <i>Coccidioides</i> fungus is present. • Keep doors and windows tightly closed.
St. Louis Encephalitis	North and South America	<ul style="list-style-type: none"> • Mosquito-borne: infection from the bite of a mosquito infected with St. Louis Encephalitis virus. 	<ul style="list-style-type: none"> • Mild: fever and headache. • Severe: headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and rarely death. 	Seek medical attention immediately if you suspect encephalitis.	<ul style="list-style-type: none"> • Use insect repellent. • Many mosquitoes are most active at dusk and dawn; consider staying indoors during these hours. • Wear long sleeves and pants. • Avoid areas of standing water

Type	Location	Exposure route	Symptoms	First Aid	Prevention
					where mosquitoes breed.
Lyme Disease	U.S., Europe, and Asia	Infection through the bite of a tick infected with: <ul style="list-style-type: none"> • <i>Borrelia burgdorferi</i> — U.S. • <i>Borrelia afzelii</i> or <i>Borrelia garinii</i> — Europe. 	<ul style="list-style-type: none"> • Spreading rash, or “bullseye.” • Early symptoms: flu-like. • Later symptoms: arthritis and neurologic problems. 	See a doctor if you suspect Lyme Disease.	<ul style="list-style-type: none"> • Avoid tick-infested areas. • Wear long sleeves and pants. • Use insect repellent. • Check clothing and hair for ticks and remove any ticks.
Rocky Mountain Spotted Fever	U.S., southern Canada, Mexico, and Central America	Infection through the bite of an infected tick — <i>Rickettsia rickettsii</i>	<ul style="list-style-type: none"> • Sudden onset of fever. • Headache. • Muscle pain. • Spotty rash. 	See a doctor if you suspect Rocky Mountain Spotted Fever.	<ul style="list-style-type: none"> • Avoid tick-infested areas. • Wear long pants, shirts. • Use a repellent. • Check clothing and hair for ticks and remove any ticks.
Hantavirus Pulmonary Syndrome — Sin Nombre Virus	North America	Inhalation of dusts or aerosols from the infected rodent’s feces, urine, or saliva. Vector: Deer mouse — <i>peromyscus maniculatus</i> .	<ul style="list-style-type: none"> • Early — 1–5 weeks: fatigue, fever, muscle aches, chills, headaches, dizziness, sometimes abdominal problems. • Late — 4–10 days after early 	Seek medical attention immediately if you suspect HPS. The likelihood of survival is greatly increased with early diagnosis and treatment.	<ul style="list-style-type: none"> • Avoid contact with rodents, especially their feces. • See section on dealing with rodent-infested areas.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
			symptoms: coughing, shortness of breath.		
Arenavirus — White Water Arroyo	North America	Inhalation of dusts or aerosols from the infected rodent's feces, urine, or saliva. <ul style="list-style-type: none"> • Vector: Woodrats — <i>Neotoma fuscipe</i> — and other <i>Neotoma</i> species. 	<ul style="list-style-type: none"> • Fever. • Headache. • Muscle aches. • Severe respiratory distress — occasionally. 	Seek medical attention immediately if you suspect WWA. The likelihood of survival is greatly increased with early diagnosis and treatment.	<ul style="list-style-type: none"> • Avoid contact with rodents, especially their feces. • See section on dealing with rodent-infested areas.
West Nile Virus	North America	<ul style="list-style-type: none"> • Mosquito-borne Infection from the bite of a mosquito infected with West Nile Virus. • Handling infected birds. 	<ul style="list-style-type: none"> • None in most people ~80% • Mild: fever, headache, body aches, nausea, vomiting, and sometimes swollen glands or a rash on the chest, stomach and back. • Severe: high fever, neck stiffness, stupor, muscle weakness, disorientation, coma, tremors, 	See a doctor if you suspect that severe symptoms are due to West Nile Virus.	<ul style="list-style-type: none"> • Use insect repellent. • Many mosquitoes are most active at dusk and dawn; consider staying indoors during these hours. • Wear long sleeves and pants. • Avoid areas of standing water where mosquitoes breed. • Don't handle dead birds with your bare hands.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
			convulsions, vision loss, numbness, paralysis.		

Appendix J — Diseases International

Type	Location	Exposure route	Symptoms	First Aid	Prevention
Dengue Fever	Africa, Southeast Asia, China, India, Middle East, South and Central America, Australia, and the Pacific Islands	Mosquito-borne infection from the bite of a mosquito infected with one of four dengue viruses.	<ul style="list-style-type: none"> • Flu-like. • Sudden, high fever. • Severe headache. • Pain behind eyes. • Nausea and vomiting. • Rash. 	<ul style="list-style-type: none"> • See a healthcare provider if you suspect Dengue Fever. • Takes up to one month to recover. 	<ul style="list-style-type: none"> • Wear long sleeves and pants. • Use insect repellent. • Use a mosquito net.
Chikungunya virus	Africa, Asia, Europe, and the Indian and Pacific Oceans, Caribbean	Mosquito-borne infection from the bite of a mosquito infected Chikungunya virus.	<ul style="list-style-type: none"> • Fever. • Joint pain. • Rash. • Headache. • Muscle pain. • Joint swelling. 	<ul style="list-style-type: none"> • See a healthcare provider. • Treat symptoms: <ul style="list-style-type: none"> ○ Rest. ○ Hydrate. ○ Take acetaminophen or paracetamol to reduce fever and pain. 	<ul style="list-style-type: none"> • Wear long sleeves and pants. • Use insect repellent. • Use a mosquito net.
Lyme Disease	U.S., Europe, and Asia	Infection through the bite of a tick-infected with	<ul style="list-style-type: none"> • Spreading rash or “bullseye.” 	See a doctor if you suspect Lyme Disease	<ul style="list-style-type: none"> • Avoid tick-infested areas. • Wear long sleeves and pants.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
		<ul style="list-style-type: none"> • <i>Borrelia burgdorferi</i> — U.S. • <i>Borrelia afzelii</i> or <i>Borrelia garinii</i> — Europe. 	<ul style="list-style-type: none"> • Early symptoms: flu-like. • Later symptoms: arthritis and neurologic problems. 		<ul style="list-style-type: none"> • Use insect repellent. • Check clothing and hair for ticks and remove any ticks.
Ebola	Outbreaks occur primarily on the African continent.	Direct contact with an infected animal, like a bat or nonhuman primate, or a sick or dead person infected with Ebola virus.	<ul style="list-style-type: none"> • Fever. • Aches and pains. • Severe headache. • Muscle pain. • Joint pain. • Weakness and fatigue. • Sore throat. • Loss of appetite. • Gastro-intestinal symptoms, including abdominal pain, diarrhea and vomiting. • Unexplained hemorrhaging, bleeding or bruising. 	See a doctor immediately if you have traveled in an Ebola-risk area and suspect Ebola.	<ul style="list-style-type: none"> • FDA-approved vaccine available. • Avoid contact with blood and body fluids of people who are sick. • Avoid contact with items that may have come in contact with an infected person's blood or body fluids. • Avoid funeral or burial practices that involve touching the body of someone who died from Ebola virus disease or suspected Ebola virus disease. • Avoid contact with bats, forest antelopes, and

Type	Location	Exposure route	Symptoms	First Aid	Prevention
			<ul style="list-style-type: none"> • Red eyes. • Skin rash. • Hiccups. 		<p>nonhuman primate blood, fluids or raw meat prepared from these or unknown animals, called bushmeat.</p> <ul style="list-style-type: none"> • Avoid contact with semen from a man who has recovered from Ebola virus disease until testing shows that the virus is gone from his semen.
Marburg virus disease	Africa	<ul style="list-style-type: none"> • Infected bat feces or aerosols. • Person-to-person contact with those who are infected. • Direct contact with: <ul style="list-style-type: none"> ○ Blood or body fluids. ○ Objects with body fluids from a sick person with or has died from 	<ul style="list-style-type: none"> • Incubation: 2–21 days. • Sudden onset of symptoms. • Fever. • Chills. • Headache. • Myalgia. • Rash on the trunk. • Nausea. • Vomiting. • Chest pain. • Sore throat. • Abdominal pain. • Diarrhea. 	See a doctor immediately if you have traveled in a Marburg-risk area and suspect Marburg.	<ul style="list-style-type: none"> • Avoid fruit bats and sick non-human primates. • Prevent direct physical contact with someone suspected or confirmed to have Marburg virus disease by using: <ul style="list-style-type: none"> ○ Protective gowns. ○ Gloves. ○ Masks.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
		<ul style="list-style-type: none"> • Marburg virus disease. ○ Semen from a man who recovered from Marburg virus disease. ○ Contact with infected non-human primates or their body fluids. 	<ul style="list-style-type: none"> • Jaundice. • Inflammation of the pancreas. • Severe weight loss. • Delirium. • Shock. • Liver failure. • Massive hemorrhaging. • Multi-organ dysfunction. 		
Malaria — Preventable with drugs	Central and South America, Hispaniola, Africa, India, South Asia, Southeast Asia, the Middle East, and Oceania	<ul style="list-style-type: none"> • Mosquito-borne infection from the bite of an infective female <i>Anopheles</i> mosquito. • Blood transfusion. • Contaminated needles and syringes. 	<ul style="list-style-type: none"> • May take 10 days to one year for symptoms to appear. • Flu-like, fever, sweats, chills, headache, malaise, muscle aches, nausea, vomiting, jaundice. 	See a doctor immediately if you have traveled in a malaria-risk area and suspect malaria.	<ul style="list-style-type: none"> • Use a mosquito net and insect repellent. • Take antimalarial drugs; visit your health care provider 4–6 weeks before travel. • Wear long sleeves and pants.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
			<ul style="list-style-type: none"> • Untreated may cause severe complications, including death. 		
Severe Acute Respiratory Syndrome — SARS	Occurred in 2003 in North America, South America, Europe, and Asia	<ul style="list-style-type: none"> • Close person-to-person contact. • Inhalation of respiratory droplets produced when an infected person coughs or sneezes. • Touching surface or object contaminated with infectious droplets and then touching mouth, nose or eyes. 	<ul style="list-style-type: none"> • Begins with a high fever >100.4°F or 38.0°C. • Headache. • Malaise. • Some have mild respiratory symptoms at the outset. • 10–20% have diarrhea. • After two–to–seven days, may develop a dry cough. • Most develop pneumonia. 		<ul style="list-style-type: none"> • Wash your hands with soap and water frequently or an alcohol-based hand rub. • Travelers to China should avoid live food markets and contact with civets and other wildlife — no evidence that direct contact with civets has led to cases of SARS; similar viruses have been found in these animals.
Yellow Fever — Vaccine Available	South America and Africa	Mosquito-borne infection from the bite of a mosquito infected with Yellow fever virus.	<ul style="list-style-type: none"> • Flu-like. • Jaundice. • Can be fatal. 	See a doctor if you suspect Yellow Fever.	<ul style="list-style-type: none"> • Visit doctor at least 10 days before travel for the vaccine. • Wear long-sleeve shirts and pants.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
					<ul style="list-style-type: none"> • Use insect repellent. • Use a mosquito net.
Zika virus	South America, Central America, North America, Africa, Asia, Oceania	<ul style="list-style-type: none"> • Mosquito-borne infection from the bite of a mosquito infected with Zika virus. • Sexually transmitted from an infected person. • From a pregnant woman to her fetus. 	<ul style="list-style-type: none"> • Fever. • Rash. • Headache. • Joint pain. • Red eyes. • Muscle pain. 	<p>See a healthcare provider if you suspect Zika virus infection:</p> <ul style="list-style-type: none"> • Rest. • Hydrate. • Take medicines like acetaminophen to reduce fever and pain. • Do not take aspirin or other non-steroidal anti-inflammatory drugs. 	<ul style="list-style-type: none"> • Wear long-sleeve shirts and pants. • Use insect repellent. • Use a mosquito net. • Prevent sexual transmission of Zika by using condoms or not having sex.
Hantavirus — Sin Nombre Virus and Arenavirus — White Water Arroyo	Central and South America and Asia	<ul style="list-style-type: none"> • Inhalation of dusts or aerosols from the infected rodent's feces, urine or saliva. • Vector: Rodents, especially <i>Neotoma</i> and 	<ul style="list-style-type: none"> • Fever. • Headache. • Muscle aches. • Severe respiratory distress, occasionally. 	<p>Seek medical attention immediately if you suspect hantavirus or arenavirus. The likelihood of survival is greatly increased with early diagnosis and treatment.</p>	<ul style="list-style-type: none"> • Avoid contact with rodents, especially their feces. • See section on proper rodent handling for cleaning a rodent-infested area.

Type	Location	Exposure route	Symptoms	First Aid	Prevention
		<i>Peromyscus</i> species.			
Schistoso- miasis, or bilharzias	Brazil, Egypt, sub-Saharan Africa, southern China, the Philippines, and Southeast Asia	Transmitted by swimming in contaminated freshwater.	<ul style="list-style-type: none"> • Can be asymptomatic. • Acute: 2-3 weeks — fever, weight loss, weakness, cough, headaches, abdominal, joint and muscle pain, diarrhea, nausea. • Chronic disease in lungs, liver, intestines, bladder. 	See a doctor if you suspect schistomiasis.	<ul style="list-style-type: none"> • Avoid freshwater wading or swimming in endemic regions. • Heat bathwater over 50°C for at least five minutes before use.

Other vector-borne diseases: Many other diseases may pose a problem when traveling out of the country. Always check with a physician to learn the specific threats to your location of study. Some other vector-borne diseases include:

- **African Sleeping Sickness:** Carried by the tsetse fly in Africa.
- **Chagas Disease:** Transmitted by the triatomine bugs — a.k.a., conenose or “kissing” bug — in Mexico and Central and South America.
- **Encephalitis:** Carried by mosquitoes in Asia and Eastern Russia.
- **Leishmaniasis:** Transmitted by sand flies in the tropics and subtropics.
- **Filariasis:** Carried by mosquitoes in the tropics.

- **Onchocerciasis:** Causes 'river blindness' and is carried by black flies in Africa, Arabia, and Central and South America.

Other diseases: There are other diseases to be aware of when traveling outside of the U.S. While the risk of infection is generally low, it is important to be aware of and take appropriate precautions to guard against diseases such as Tuberculosis, Viral Hemorrhagic Fevers, etc. Always check with your health care provider to learn more about specific diseases in the region you will be conducting your research.

Appendix K — Field research kit items

Basic items	Remote items
First aid kit	Painkillers/antihistamines
Cold/heat packs	Epi pen — prescription needed
Nitrile or other protective gloves	Antiviral drugs — prescription needed
Soap	Seasickness tablets
Masks	Antibiotic cream
Sunscreen, hats, sunglasses	Antiseptic
Bandages	Hydrogen peroxide
Tweezers	Lip balm
Thermometer	Antifungal cream
Flashlight	Rubbing alcohol
Batteries	Eye/ear/nose drops
Insect repellent	Antacids
Flares	Anti-diarrhea medication
Fluorescent Distress flag	Laxatives
Super glue	Bed nets
Lightweight emergency blanket	Sealed container for food storage
UNC Charlotte Contact info (translated into local languages)	Whistle/noisemaker
Map, compass, GPS	Pepper spray
Cell phone and charger	Knife or multitool
Food, snacks	Tools — shovel/axe/saw
Extra water	2-way radio/battery operated radio
	Satellite phone
	Waterproof matches
	Tarps, hammer, duct tape, nails
	Signal mirror
	Jumper cables, tire gauge, spare tire, jack, tow rope, air pump
	Inflatable raft
	Foreign travel insurance card

Appendix L — Field Safety Research Risk Matrix

Field Safety Research: Risk Matrix					
Risk level	PPE recommendations based on activity and level of risk — lowest = 1; highest = 12				
	Activity	Condition	PPE	Safe work practice	Route(s) of exposure
1	Handling seemingly healthy live animals.	No substantial local zoonotic disease concerns or vectors; risk from casual contact is minimal.	<ul style="list-style-type: none"> • Disposable and/or leather gloves. • Clothing appropriate to the nature of the operation. 	Does not apply	Contact, vector
2	Handling biological samples from apparently healthy live animals.	No substantial local zoonotic disease concerns or vectors.	<ul style="list-style-type: none"> • Disposable and/or leather gloves. • Clothing appropriate to the nature of the operation. • Eye protection. 	Does not apply	Contact with body fluids or biological samples may increase risk. Contact, vector

3	Collection of biological samples like feces, urine and fetuses from the environment for management or research where no known zoonotic enzootic disease occurs.	Risk exists from contact with body fluids and tissues, but no known disease risk is present.	<ul style="list-style-type: none"> • Disposable and/or leather gloves. • Coveralls, lab coat or dedicated clothing. • Eye protection if splashes may occur. 	Store Samples in approved and dedicated specimen storage locations according to protocols.	Contact, vector
4	Handling for disposal or submission of single animal found dead in an area with no substantial local zoonotic disease or vectors.	Risk is minimal if a barrier is used. Risk may increase with the size of the animal handled because of increased chance of contamination.	<p><u>Small animal:</u></p> <ul style="list-style-type: none"> • Gloves or inverted bag. <p><u>Large animal:</u></p> <ul style="list-style-type: none"> • Disposable and/or leather gloves. • Coveralls, lab coat or dedicated clothing. 	<ul style="list-style-type: none"> • Use appropriate precautions for transmission routes of diseases of concern. • Transport outside passenger area of vehicle — truck bed or trunk. • Bag carcass tightly if it must be placed in passenger compartment or to avoid leakage of body fluids into the environment. • Cover all carcasses. 	Contact, vector

5	<p>Handling multiple animals found dead for disposal or submission in an area without substantial zoonotic disease risk or handling single animal or multiple animals in an area with substantial zoonotic disease risk.</p>	<p>Risk may differ if the mortality event is recurring. For example, juvenile birds washed ashore as opposed to unexpected.</p>	<p><u>Small animal:</u></p> <ul style="list-style-type: none"> • Gloves or inverted bag. <p><u>Large animal:</u></p> <ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Eye protection. • As appropriate to disease: respiratory protection as appropriate to the level of risk. 	<p>Follow work practices in number 4. In addition:</p> <ul style="list-style-type: none"> • Inform colleagues and consult with wildlife disease professionals for potential causes of illness. • In an unexpected mortality event: submit 1–5 animals for diagnostic evaluation and dispose of remaining carcasses in landfill or other approved means. <ul style="list-style-type: none"> • Store samples in approved locations. • Become familiar with human disease symptoms and seek medical attention if symptoms occur. Inform health care provider of occupation and potential exposure. 	<p>Contact, vector</p> <p>Aerosol, in rare circumstances</p>
6	<p>Briefly handling or contacting live or dead animals incidental to other work assignments.</p>	<p>Incidental exposure as a result of other indoor or outdoor duties.</p>	<p><u>Small animal:</u></p> <ul style="list-style-type: none"> • Gloves or inverted bag. <p><u>Large animal:</u></p> <ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat, or dedicated clothing. 	<ul style="list-style-type: none"> • Inform colleagues as appropriate. • Transport outside passenger area of vehicle — truck bed or trunk). • Bag carcass tightly if it must be placed in passenger compartment to avoid leakage of body fluids into the environment. • Cover all carcasses. 	<p>Contact, vector</p>

7	Handling seemingly healthy live animals, or samples, from areas with known zoonotic disease risks.	Disease exists in, or spills into, handled species or associated vectors. For example, plague, rabies, brucellosis.	<ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Eye protection. • As appropriate to disease: respiratory protection as appropriate to the level of risk. 	<ul style="list-style-type: none"> • Use appropriate precautions for transmission routes of diseases of concern. • Become familiar with symptoms of the disease in humans and seek medical attention if symptoms occur. Inform health care provider of occupation and potential exposure. 	Contact, vector Aerosol
8	Handling sick or injured live animals for euthanasia, sampling, or transportation.	Risk increases because animal movement may increase contact; illness may be zoonotic and increase sources of contaminants. For example, diarrhea.	<ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Shoe covers or boots that can be disinfected. • Eye protection. • As appropriate to disease: respiratory protection as appropriate to the level of risk. 	<ul style="list-style-type: none"> • Use appropriate precautions for transmission routes of diseases of concern. • Submit diagnostic samples from sick animals. 	Contact, vector Aerosol

9	<p>Handling healthy-appearing animals collected for management or research, or found dead with no known zoonotic disease risk for necropsy, dissection or food processing.</p>	<p>Risk is increased because of closer contact with body fluids and tissues, but no reason to suspect high-risk zoonotic pathogens.</p>	<ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Shoe covers or boots that can be disinfected. • If performing necropsy, dissection, or food processing: Eye protection. • As appropriate to disease: respiratory protection as appropriate to the level of risk. 	<p>If an animal has received any drugs (anesthetics, euthanasia agent), it is unfit for human consumption and must be removed or withheld from the human food chain.</p>	<p>Contact, vector Aerosol</p>
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10	Collection of biological samples — feces, urine, fetuses — from the environment for management or research where zoonotic disease vectors occur.	Risk from contact with body fluids and tissues from potentially infected animals or their parasites.	<ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Eye protection. • Shoe covers or boots that can be disinfected. • As appropriate to disease: respiratory protection as appropriate to the level of risk. 	<p>Use appropriate precautions for transmission routes of diseases of concern. In addition:</p> <ul style="list-style-type: none"> • Inform colleagues and consult with a wildlife disease professional for potential causes of illness. • Become familiar with disease symptoms in humans and seek medical attention if symptoms occur. Inform health care provider of occupation and potential exposure. 	<p>Contact, vector Aerosol</p>
11	Handling dead animal that was observed ill or a species with known zoonotic disease risk. For example, prairie dog, ground squirrel for necropsy or dissection.	Risk is increased because of closer contact with body fluids and tissues and unknown cause of death.	<ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Eye protection. • Shoe covers or boots that can be disinfected. • Respiratory protection as appropriate to the level of risk. 	<ul style="list-style-type: none"> • Inform colleagues and consult with wildlife health disease professionals for potential causes of illness. • Become familiar with disease symptoms in humans and seek medical attention if symptoms happen. Inform your health care provider of occupation and potential exposure. • Become familiar with warning signs for unusual mortality events: multiple dead animals, blood coming from orifices — nose, rectum — without signs of trauma, animals displaying neurologic signs before death. 	<p>Contact, vector Aerosol</p>

12	Cleaning areas of animal excreta and handling rodents in traps in indoor or field locations with significant accumulation of organic matter.	Large quantities of mouse excreta and bird or bat guano are of considerable concern, especially in indoor settings.	<ul style="list-style-type: none"> • Disposable or leather gloves. • Coveralls, lab coat or dedicated clothing. • Eye protection. • Shoe covers or boots that can be disinfected. • Respiratory protection as appropriate to the level of risk. 	See precautions for workers frequently exposed to rodents in “Hantavirus Pulmonary Syndrome — U.S. — Updated Recommendations for Risk Reduction.” Available at: cdc.gov/mmwr/preview/mmwrhtml/rr5109a1.htm	Contact, vector Aerosol
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Modified from U.S. Geological Survey manual “[Safe Work Practices for Working with Wildlife](#).” Contact EHS Biosafety with questions regarding risk levels and for up-to-date information about known zoonotic risks where research will be performed.