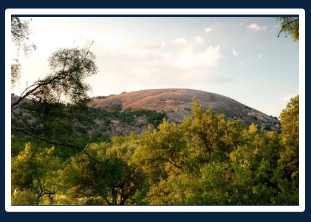
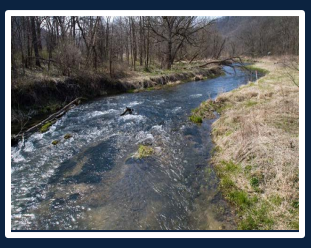
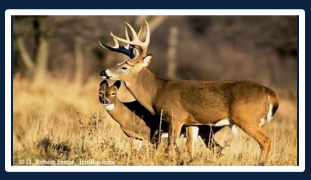






UTSA Laboratory Safety

FIELD SAFETY PLAN

FOR OFF CAMPUS RESEARCHERS

Laboratory Safety Division

UTSA
Office of the Vice President for Research, Economic Development, and Knowledge Enterprise

2023

TABLE OF CONTENTS

REVIEW PAGE

This version of the manual has been reviewed for regulatory compliance and best management practices by the listed individuals and is hereby adopted for use and compliance by all employees at the University of Texas at San Antonio owned or operated facilities.

NAME	TITLE	DATE
Cynthia Galindo	Physical Safety and Engineering Coordinator	8-01-2023
Mohammad R Khan	Biosafety Officer	8-01-2023
Anthony Vallejo	Director of Laboratory Safety and HMM	8-01-2023
Melinda Cotten	Interim Associate Vice President for Research Integrity	8-01-2023

Revised 8/1/2023 from previous version of plan 8/3/2022.

EMERGENCY CONTACTS

ROUTINE OFFICE HOURS (8 am – 5 pm)	
Laboratory Safety	210-458-8515
AFTER-HOURS (including weekends)	
Assistant Director of Laboratory Safety and Compliance	210-452-7253
UTSA Wellbeing Services	210-458-4140
UTSA Police	210-458-4911 (cell or outside phone) x4911 (from a campus phone)
LIFE-THREATENING EMERGENCIES (any time)	
UTSA Police	210-458-4911 (cell or outside phone) x4911 (from a campus phone)

ROUTINE CONTACTS

In case of incidents involving biological exposures, all personnel are required to notify the Biological Safety Officer immediately at 210-458-5807 or 210-336-9509

After 5:00 pm and on weekends, UTSA Police will assist in contacting Laboratory Safety Personnel.

INTRODUCTION

OVERVIEW

This Field Safety plan represents the institutional practices and procedures for Fieldwork and off campus environmental hazards of The University of Texas at San Antonio. The Laboratory Safety Division has revised this document based on the latest government regulatory requirements, guidelines, and current professional standards.

Safety is a core value at UTSA, and the University is committed to continued advancement of an institutional safety culture. Research excellence and safety are inextricably linked, and the protection of researchers, the environment, and the broader community are an integral part of the responsible conduct of research.

The Laboratory Safety Division is responsible for monitoring individual principal investigators and laboratory facilities for adherence to the practices and procedures described in this manual. However, it is the responsibility of each principal investigator to ensure that all lab workers are familiar with the contents of this manual and that these workers and employees are trained to recognize potential related hazards prior to initiation of the research work. Your cooperation with the Laboratory Safety Division Office is essential to comply with the regulatory requirements that our university must follow in order to continue the success of our research endeavors.

PURPOSE

The purpose of this Field Safety Manual is to establish UTSA Lab off campus safe work practices that meet regulatory requirements and match the types of hazards found in the field. It is written in a manner that serves as a guiding and reference document, and to promote intrinsic safety culture via self-assessment.

The Fieldwork practices prescribed in this manual are mandatory, unless specifically indicated as a recommended practice.

This manual does not include work done on UTSA owned or leased properties.

The Laboratory Safety Division and Office of Research Integrity prepared this plan after review of pertinent federal and state regulatory requirements from regulatory agencies and organizations.

While not all regulatory standards are applicable to UTSA, the guidelines and recommendation outlined in this manual are based on these documents to establish a level of safe practices equal to that found in industry and national laboratories.

- Occupational Health and Safety Administration(OSHA)
- Texas Department of State Health Services
- Texas Commission on Environmental Quality(TCEQ)
- Centers for Disease Control and Prevention(CDC) https://www.cdc.gov/biosafety/publications/bmbl5/index.htm
- CURRENT OSHA Field Safety and Health Manual
- NIOSH Outdoor Topics

Research and education in science laboratories and off campus fieldwork involves a variety of hazards. It is the University of Texas at San Antonio's (UTSA) policy to protect and promote the health and safety of students and employees as well as the environment. This plan outlines basic good laboratory safety practices, special procedures for this institution, federal and state guidelines, and references to other information sources for work in laboratories or do off campus fieldwork that handle, use, or store biological agents.

This is not intended to be a fully comprehensive reference but rather a guidebook. There may be agents, procedures, or other circumstances in each laboratory or off campus activity that present unique or unusual hazards not addressed in this manual. If necessary, such hazards are best addressed by the principal investigator or supervisor, team leader of the respective laboratory in consultation with the Laboratory Safety Division.

Faculty, staff and students who may be exposed to biological or physical hazards in the laboratory or in the course of off campus fieldwork must be informed of the nature of these hazards and how to protect themselves and others who may be exposed. Safety in the laboratory and off campus in the field can only be achieved with the exercise of sound judgment and proper use of facilities and equipment by informed, responsible individuals.

SCOPE

This fieldwork plan applies to all work outside of UTSA operated (leased or owned) facilities. It also applies to any UTSA employee, volunteer or student worker(s) who work directly with, or in close proximity to, anyone conducting research that falls under federal and state regulations or guidelines for working off campus.

All researchers working with biological materials must also follow the UTSA Biological Safety Plan. All researchers working with chemicals must follow the UTSA Chemical Hygiene Plan.

PERIODIC REVIEW

This plan will be reviewed as needed, and yearly by the Laboratory Safety Division. The online version of this plan will be reviewed periodically for updates on the VPREDKE website at: http://www.utsa.edu/safety/#/laboratory/manuals. Questions can be addressed to the Director of Laboratory Safety, through the Laboratory Safety Division at 210-458-8515.

RESPONSIBILITIES

Departments with employees or students participating in fieldwork activities shall ensure that each group has considered the health and safety hazards associated with these activities and developed a safety plan that adequately addresses those hazards. Department heads shall approve incorporation of high risk activities (such as use of heavy equipment, piloting a boat, etc) into any fieldwork program.

Each Prinicipal Investigator conducting fieldwork shall:

- Develop a Safety Plan for fieldwork activities that identifies likely hazards associated with the activity or physical environment (such as weather, wildlife, plants, endemic diseases, water-borne diseases, radiation, tools/equipment/chemicals to be used, noise, heights/steep terrain, unusual methods of travel, violence or crime). The safety plan must also include a plan for communications in case of emergency.
- Provide training on hazards and prevention of exposure to hazards, or ensure certification/licensing for high-risk activities such as use of heavy equipment or piloting a boat. High-risk activities require department head approval before they can be incorporated into any fieldwork program.
- Provide training on appropriate emergency response to injuries or illnesses, including location of nearest medical care facilities in case they may be needed.
- Investigate all incidents to determine their cause and, where possible, incorporate preventative measures into the safety plan.
- Notify the department of incidents. Notify Lab Safety of near-misses or incidents. Also if relevent, notify Human Resources or Corporate Risk Management.
- Designate a field team leader for each excursion who will carry out the responsibilities names below.
- Set up a system for keeping track of personnel who will be in the field so that someone on campus either in the lab or department knows where personnel will be, how to contact them and when they expect to be back, etc.

The Field Team Leader shall:

- Ensure adequate training of all team members.
- Ensure implementation of controls such as PPE, medical precautions.
- Ensure that at least one team member is certified in first aid/CPR and ensure that a first aid kit is available.
- Ensure adequate provisions for food, water, shelter, communication and transportation.
- Conduct ongoing risk assessments and report new hazards to the Principal Investigor.
- Resolve safety concerns arising in the field.
- Maintain regular contact with the PI or department when in the field.
- Inform PI or department of all incidents (eg. injuries, illnesses, or near-misses)

Employees and students participating in fieldwork activities shall:

- Communicate all medical restrictions to the lead instructor or Principal Investigator and the Field Team Leader before participating in field work activities. Consult with Employee Occupational Health and Wellness or Student Health for guidance if needed or if requested by the Principal Investigator or Field Team Leader.
- Provide planned itinerary and communicate leaving for and returning from the field as required by the Principal Investigator
- Review the safety plan and become familiar with the risks identified as the relevant control strategies
- Follow guidance from the PI, lead instructor and/or team leader for minimizing risks.
- Notify the team leader, or PI of newly identified hazards
- Report all incidents, accidents and near-misses to the PI or Team Leader.
- Take all required training, including online Safety Training

The Laboratory Safety Division shall:

- Provide guidance and support to employees developing safety plans for fieldwork
- Provide online safety training for fieldwork

SAFETY CULTURE

WHAT IS SAFETY CULTURE

Establishment of a safety culture starts with unambiguous and repeated messages from the organization's top leadership that safety is an important value.

Several high-profile accidents in the research world have led to the realization that ensuring excellence in research requires a strong, positive safety culture throughout the University. This means that safety is viewed as an operational priority, because of the benefits thoughtful, safe procedures and attitudes bring to research.

SAFE RESEARCH AT UTSA

Research and education in science laboratories involves a variety of hazards. It is the University of Texas at San Antonio's (UTSA) policy to protect and promote the health and safety of students and employees as well as the environment. As an educational institution UTSA endeavors to impart a foundation of safety culture that will prepare students to be safe and skilled scientists in academia or industry.

Safety an outdoor setting can be achieved only with the exercise of sound judgment and proper use of equipment by informed, responsible individuals.

Safe research starts with recognizing that safety is a fundamental part of the scientific process, adding value by exerting greater control, reducing uncertainty, and increasing the safety and quality of your results or product.

RESEARCH SAFETY EXPECTATIONS

The University expects that all members of our research community integrate safety into their research activities and go beyond minimum compliance. The following elements (Fig 1) help lay the foundation to build and support a safe and productive research environment:

Figure 1. Four Elements of Research Safety

A. Leadership

Lead by example, adhere to the rules, and be willing to speak up if you see unsafe practices. Faculty and Team Leaders are urged to include safety on the agenda and incorporate it into their group thinking and practices.

- *Lab members openly discuss safety concerns.*
- *PI/laboratory manager and research team members maintain an environment in which personnel feel free to raise concerns.*
- *Actions confirm safety as a priority that supports and is compatible with good research.*
- *The feedback loop on safety issues (bottom-up and top down) is closed (addressed) at the PI/lab management level.*

B. Design

Take the time to systematically assess risk and plan for the hazards identified. Incorporate safety into fieldwork procedures.

- *PI/lab manager understands the risks of the research being conducted, are actively involved in the fieldwork safety program, and integrate safety into the fieldwork research culture.*

C. Execution

Take action to control your risks. Make sure that you have the right protective equipment, your equipment is working correctly, and that all team members are trained to safely perform their work. Principal investigators (Team Leaders) must enforce the established controls within their group.

- *PI/Team Leader ensures that the personnel, equipment, tools, procedures, and other resources needed to ensure safety in the fieldwork site are available.*
- *Team members identify and manage their own safety environment and are receptive and responsive to queries and suggestions about fieldwork safety from their colleagues and team members.*
- *Team members conduct their research using protocols and procedures consistent with best safety practices.*

D. Adaptability

Research is not a static endeavor; managing safety requires ongoing reassessment, feedback, and reinforcement. Encourage reporting by members when identifying and reviewing lessons learned after and using these as teaching opportunities. Involve all lab incidents and near-misses.

- *PI/Team Leader evaluates the fieldwork safety status themselves and knows what and how to manage changes in outdoor conditions.*
- *The PI/Team Leader and Team supports a continuous learning environment in which opportunities to improve safety are sought, communicated and implemented.*
- *Safety discussions become part of meetings; near misses within the fieldwork assignment are reported in a timely manner and safety information is requested by team members to prevent future mishaps through understanding HOW and WHY.*

A. Safe Learning Environment

A Safe Learning Environment is a group culture that emphasizes effective communication, physical and emotional safety of all group members, mutual respect and shared responsibility for the group's wellbeing.

Fieldwork accidents happen most often due to poor communication, along with challenging conditions and/or inadequate preparation.

B. Ingredients for a Safe Learning Environment

Articulate a Shared purpose. The team leader should share their goals/vision for the fieldwork trip. They should develop shared group goals with the team participants.

Support Individual Group Member's Needs. Humans need to feel valued, physically and emotionally safe, have a sense of autonomy, experience fun, etc. Team leaders should build genuine connections with the group and listen to their concerns.

Build a Clear Structure. Plan/schedule your course/expedition. Define and maintain clear roles, expectations and behavioral norms.

Good Team Leadership provides a closed loop for Psychological Safety. The two most essential actions identified for this functionality are (1) participatory management and (2) Inclusive management. A clear team structure and strong team relationships are characteristics most conducive to Psychological Safety.

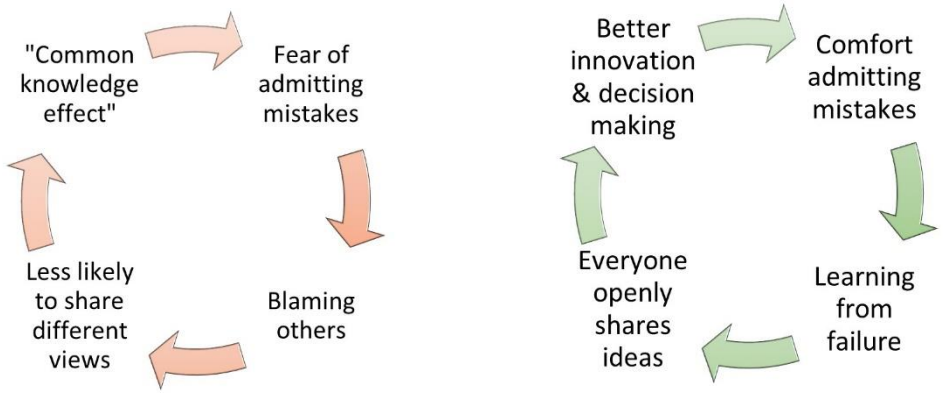


Figure 2. Psychological Danger vs Psychological Safety

RISK ASSESSMENT FOR RESEARCH

Evaluation and assessment of risk is a key part of designing and conducting an experimental protocol. Not only does a thorough risk assessment allow researchers to systematically identify and control hazards, but it also improves the quality of science through more thorough planning, a better understanding of the variables, and by sparking creative and innovative thinking. It allows one to implement tighter controls which reduces uncertainty and increases the safety and quality of your results/product. Failure to consider risk and hazards from the beginning of experimental design can produce delays, roadblocks, and frustration later in the process.

The Risk Assessment process is broken down into four steps: and by sparking creative and innovative thinking.

A. Explore

Determine the scope of your work, beginning with location you will be working. Is it a remote location? What is the terrain like? Are there wildlife in the area to be concerned about? Are there fluctuations in weather? Use resources like NOAA or TDPW to research the area before you go.

B. Plan

Outline your trip. Determine hazards associated with each step, and control measures for reducing risk. For example, in areas of extreme heat, plan to take lots of water, sunscreen, work in the coolest parts of the day and monitor group participants regularly for signs of heat exhaustion. What is the plan of action for a worst case scenario (ie heatstroke)?

C. Challenge

What assumptions did you use? Question the importance of each step. Seek advice from others. Ask yourself "what could go wrong?". Have I missed anything? Consider all possible outcomes, how high is the risk?

D. Assess

Implement a trial run. Can you perform a dry run to familiarize yourself with equipment and procedures? Can you hike similar terrain to get an idea of the footwear required to keep you steady? Determine if any design changes are needed. Assess as you go and make changes as needed.

HIERACHY OF CONTROLS

Controlling exposure to hazards is a fundamental reference for protecting individuals against hazards. This hierarchy is effective in a structured laboratory building environment but not as practical in the field or fieldwork environments. The hierarchy of controls is commonly represented as:

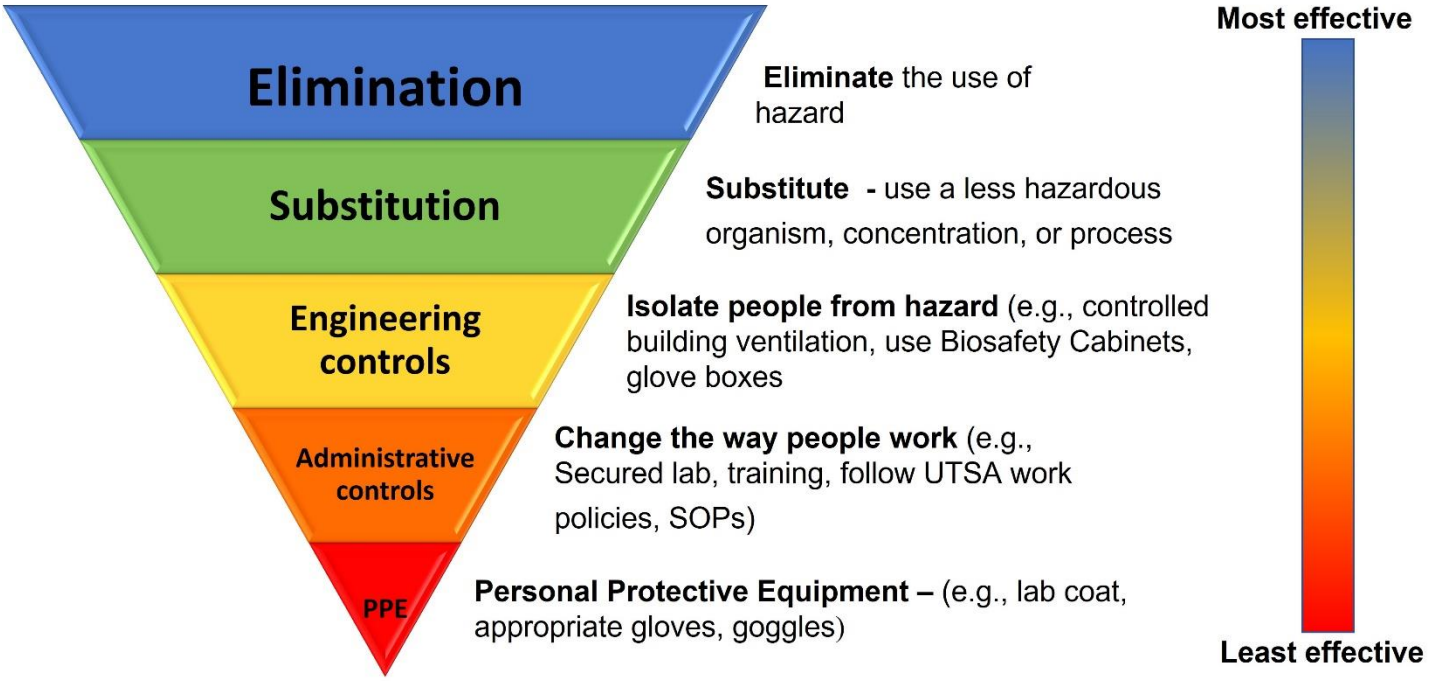


Figure 3. Hierarchy of controls for minimizing hazards.

A. Elimination

While elimination of a hazard is always the safest option it is often not practical in the field research environment. For example, taking a chemical reagent kit to test samples to the field. To eliminate the hazard from the chemicals (spills, storage, etc) you would have to eliminate the chemical kit from the trip. Instead bring samples back to the lab and do the assay there. That may not be practical.

B. Substitution

Substitution is often an easier option in procedures. Instead of using a toxic chemical reagent, perhaps a less toxic or less hazardous assay kit can be used instead.

C. Engineering Controls

Engineering controls are a key laboratory feature and are designed to remove the hazard at the source before

it can encounter the worker. Examples are fume hoods, biosafety cabinets and other equipment. However, in the field environment, there are no engineering controls. This leaves field workers vulnerable to biological and chemical hazards.

D. Administrative Controls

Administrative controls are used extensively to support field safety. Examples of administrative controls include Standard Operating Procedures (SOPs), training, and safety plans. The effectiveness of administrative controls are an essential component of any strong field safety program, especially since engineering controls are almost non existent in field environments.

E. Personal Protective Equipment

Personal Protective Equipment (PPE) is generally considered one of the least effective safety controls. PPE does not control the hazard at the source rather protects the worker if all other control methods have failed. As with engineering controls, PPE is only effective if used and maintained correctly. Due to lack of engineering controls in the field, field workers should take gloves, protective eye wear and other protective equipment with them to the field to protect themselves against biological or chemical hazards.

FIELDWORK PLANNING

Whether you are a field team leader or team member, effective communication is critical to creating and maintaining a safe working environment in the field.
In a team setting, being able to communicate effectively will foster a culture of mutual respect and a shared responsibility for the group's well being. The field team leader should establish the safety rules prior to beginning the field work.

Team members should respect the authority of the team leader and follow the safety rules at all times.

Preparing adequately involves training, knowing what kind of provisions to pack, and checking that equipment and vehicles are in working order. Satellite radio communication is necessary to work in areas with no cell phone coverage to reach out for help in case if emergency. Also, properly pack a first aid kit for the amount of days and number of people on the trip.

A checklist of equipment and safety items should be used before leaving for the field.

Creating a Fieldwork Safety Plan before the off-campus work activity ensures communicating all aspects of

the trip with team members.

Fieldwork Safety Plan

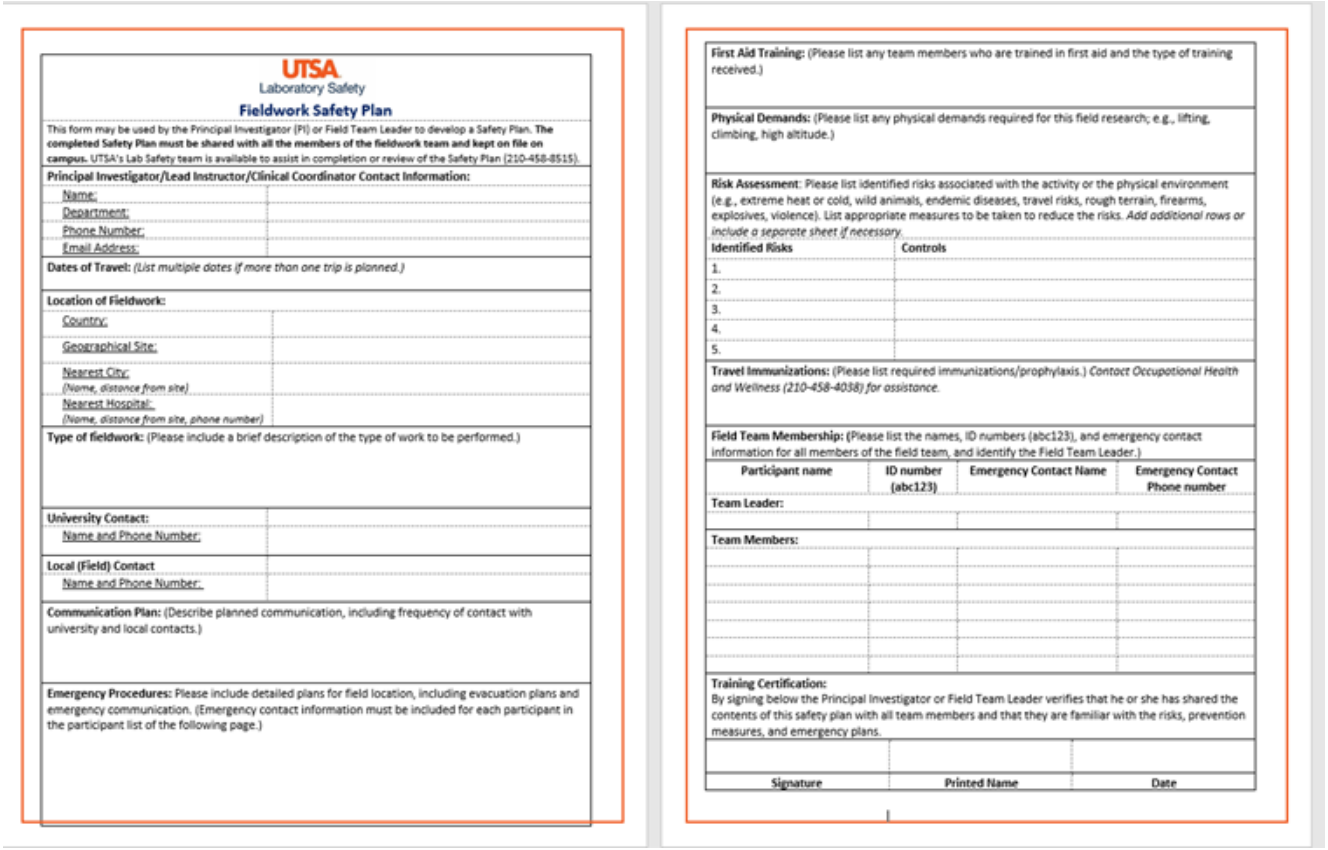
A Fieldwork Safety Plan serves as a tool to document your hazard assessment, communication plan, emergency procedures and required training. Planning and preparation are the most important parts of your fieldwork trip.

You should plan for emergency situations that may arise and make sure you have appropriate documentation readily available in case of emergency.

Consider the risks involved before you leave on the trip will help you when planning your activities. Will you face issues with weather, plants, terrain, wildlife? What about chemical hazards or ergonomic hazards?

Complete the Fieldwork Safety Plan and leave a copy with a team member who will remain on campus.

Example of Fieldwork Safety Plan



UTSA
Laboratory Safety

Fieldwork Safety Plan

This form may be used by the Principal Investigator (PI) or Field Team Leader to develop a Safety Plan. **The completed Safety Plan must be shared with all the members of the fieldwork team and kept on file on campus.** UTSA's Lab Safety team is available to assist in completion or review of the Safety Plan (210-458-8515).

Principal Investigator/Lead Instructor/Clinical Coordinator Contact Information:	
Name:	
Department:	
Phone Number:	
Email Address:	

Dates of Travel: *(List multiple dates if more than one trip is planned.)*

Location of Fieldwork:	
Country:	
Geographical Site:	
Nearest City: *(Name, distance from site)*	
Nearest Hospital: *(Name, distance from site, phone number)*	

Type of fieldwork: (Please include a brief description of the type of work to be performed.)

University Contact:	
Name and Phone Number:	

Local (Field) Contact	
Name and Phone Number:	

Communication Plan: (Describe planned communication, including frequency of contact with university and local contacts.)

Emergency Procedures: Please include detailed plans for field location, including evacuation plans and emergency communication. (Emergency contact information must be included for each participant in the participant list of the following page.)

First Aid Training: (Please list any team members who are trained in first aid and the type of training received.)

Physical Demands: (Please list any physical demands required for this field research; e.g., lifting, climbing, high altitude.)

Risk Assessment: Please list identified risks associated with the activity or the physical environment (e.g., extreme heat or cold, wild animals, endemic diseases, travel risks, rough terrain, firearms, explosives, violence). List appropriate measures to be taken to reduce the risks. *Add additional rows or include a separate sheet if necessary.*

Identified Risks	**Controls**
1.	
2.	
3.	
4.	
5.	

Travel Immunizations: (Please list required immunizations/prophylaxis.) *Contact Occupational Health and Wellness (210-458-4038) for assistance.*

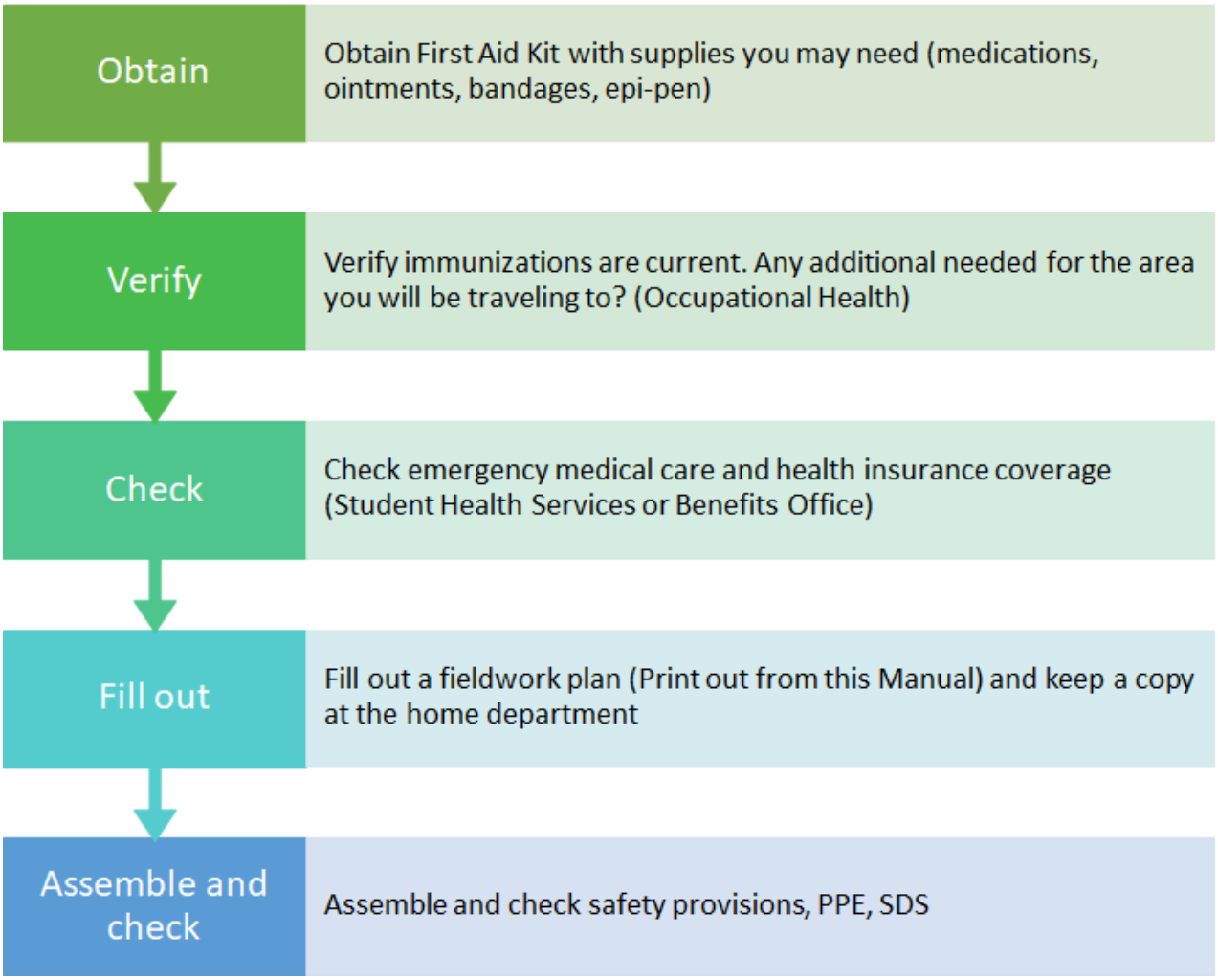
Field Team Membership: (Please list the names, ID numbers (abc123), and emergency contact information for all members of the field team, and identify the Field Team Leader.)

Participant name	**ID number (abc123)**	**Emergency Contact Name**	**Emergency Contact Phone number**
Team Leader:			
Team Members:			

Training Certification:
By signing below the Principal Investigator or Field Team Leader verifies that he or she has shared the contents of this safety plan with all team members and that they are familiar with the risks, prevention measures, and emergency plans.

Signature	**Printed Name**	**Date**

TRIP SAFETY CHECKLIST



A list of safety equipment should be prepared and checked over before leaving on the trip. Examples of safety items include emergency road repair kit, flashlights, flares, proper clothing, water purification, medications, first aid kits or specialized equipment.

Specialized equipment includes such items as GPS, compass, charts, climbing gear, safety vests, snake boots (PPE), sampling equipment or Satellite Radio.

All Users should be properly trained in the use of specialized equipment.

CHECKLIST EXAMPLE

UTSA Field Trip Safety Inspection Checklist

1. Travel Details
   - ☐ Vehicle roadworthy
   - ☐ Driver of vehicle appropriately licensed
   - ☐ Appropriate insurances in place and cover all people
   - ☐ Adequate number of drivers (eg. to cover rest periods)
   - ☐ Environmental influences that may affect driving conditions (eg. weather, terrain, etc)

2. Communication
   - ☐ Adequate number and type of communication devices available
   - ☐ Will communication devices work in the field trip location
   - ☐ Mobile Phone-fully charged

3. Supervision
   - ☐ Adequate number of staff to supervise students
   - ☐ First aider available

4. Field Site Hazards

   Which of the following hazards will be on site?
   - ☐ Water- physical, chemical, biological
   - ☐ Soil- physical, chemical, biological
   - ☐ Bites and stings
   - ☐ Exposure to outdoor UV Radiation
   - ☐ Exposure to cold conditions
   - ☐ Exposure to hot conditions-working in heat
   - ☐ Changes in weather conditions
   - ☐ Electrical- electric gate, fences, generator, etc.
   - ☐ Traffic hazards
   - ☐ Manual handling
   - ☐ Risk Assessment-completed and signed off

5. Chemicals
   - ☐ Labelling-all chemicals correctly and clearly labelled
   - ☐ Chemicals well packed and stored for transport
   - ☐ Disposable Gloves and Safety Glasses-packed
   - ☐ MSDS available for each chemical
   - ☐ Risk Assessment- up to date, comprehensive

6. Biological
   - ☐ Soap and water for hand washing
   - ☐ Protective gloves
   - ☐ Immunization (if applicable)

7. Electrical
   - ☐ Visual inspection of all electrical leads
   - ☐ Visual check of equipment tags

8. Equipment/Mechanical
   1. Field Instruments
      - ☐ Instruments maintained and in good condition
      - ☐ User trained in correct use of instruments
      - ☐ Instrument body, sensors and cabling thoroughly cleaned after field work
   2. Field Equipment
      - ☐ Equipment maintained and in good condition
      - ☐ User trained in correct use of equipment
      - ☐ Equipment decontaminated after field work

9. Manual Handling
   - ☐ Risk Assessment- up to date, comprehensive

10. Field Trip Safety Training
    - ☐ Complete and sign UTSA Field Safety Plan
    - ☐ Give a copy of the UTSA Field Safety Plan to someone not on the field trip

11. Emergency Procedures
    - ☐ First Aid Kits-fully stocked
    - ☐ Emergency contact numbers provided
    - ☐ Local Hospital, police numbers easily accessible in event of emergency

12. Personal Protective Equipment
    - ☐ Footwear-check condition-appropriate for terrain?
    - ☐ Safety vests
    - ☐ Waders/boots
    - ☐ Wet weather gear

SATELLITE RADIO COMMUNICATION

Cell phone coverage is spotty, at best, in remote areas. Satellite radios are used to ensure that the worker can maintain communication with the rest of the team or with the outside world.

Devices such as the Garmin InReach allow two-way communication, GPS and even Interactive SOS alerts in case of emergency.

For more information about Garmin InReach products see: Garmin website.
The UTSA Outdoor Resource Center is also available to assist with product selection and may lend out satellite communication devices on a case by case basis. For more information email outdoors@utsa.edu or call 210-458-6720.

FIRST AID TRAINING

First Aid and Wilderness First Aid courses are great for learning how to provide first aid treatments for injuries and illnesses common in the outdoors and how to make appropriate evacuation decisions.

UTSA offers both American Red Cross First Aid and NOLS Wilderness First Aid courses through the Campus Recreation Outdoor Resource Center. For more information contact Todd Grier, Assistant Director UTSA Outdoor Pursuits, 210-458-7575.

First Aid Kits should be customized to your group and activity. Pack items for wounds and injuries, medications and ointments, gloves, tweezers and more. For more information about what to pack in your first aid kit, see the National Parks Foundation webpage.

PERSONAL SAFETY

Personal safety is a general recognition and avoidance of possible harmful situations or persons in your surroundings.

Off campus work is still work and UTSA policies such as Alcohol and Drug use (HOP 9.18 Drugs and Alcohol) Title IX (HOP 9.24 Policy on Sexual Harassment and Sexual Misconduct) apply. Team leaders should make it clear before a trip that all team members are expected to abide by UTSA Alcohol, drug use and sexual harassment policies as if they were working on campus.

For more information or to file a complaint about sexual misconduct contact: Suzanne Patrick, Title IX Coordinator and Equal Opportunity Services Director, 210-458-4120
Reports of Sexual Violence should also be made to law enforcement.

UTSAPD 210-458-4911

San Antonio PD 210-207-7273

Bexar County Sheriff's Department 210-335-6000

REMOTE AREAS

Workers heading to remote areas should avoid working alone. Be aware that remote areas are not always desolate. You may run across people hiding illegal activities such as meth labs.

Meth labs are found in **remote areas** of some of our national forests. Meth lab sites are full of chemical hazards that can contaminate the surroundings with harmful fumes and explosive chemical compounds.

If you suspect a meth lab, leave at once and report it.
Do not open any coolers. Do not touch any items. Handling methamphetamine waste residue can burn your skin and eyes, and breathing in the gases can send you to the hospital. Handling these chemicals with unprotected skin, or getting the dust in your eyes can cause serious damage.

Avoid meth lab sites and confronting people. Carry a satellite radio device with one button SOS call and GPS in case of emergency.

The US Forest Service Department of Law Enforcement and Investigations provides tips for personal safety and is a great resource for additional information on Dangers of Meth Labs.

TEXAS (REGION 8) SOUTHERN REGION, 404-347-2784

TRESPASSING

Trespassing means stepping onto private property without permission. Trespassing onto private property can lead to confrontations with irate landowners.

To avoid trespassing:

- Make sure you obtain required permission to be on the premises.
- Carry your UTSA ID on your person where it can be easily seen.
- If working outside, wear bright colored, reflective Safety Vests with Staff/Student logo to be easily recognized.

If confronted about trespassing, be prepared to show identification, announce yourself as University personnel/student and communicate the reason you are there. Leave the premises if requested.

ABANDONED MINES

Abandoned mine sites have many safety hazards. There may be old explosives, hazardous chemicals, bats, snakes, spiders, bobcats, or other predators.

Other dangers include falls, cave-ins. The entire area near an opening is often unstable and may cave into the shaft, carrying an unsuspecting person along with it. Old boards covering mine shaft may collapse without warning. Pools of water on the floor of a mine could conceal deep holes in the floor of a mine tunnel. Stepping into a deep hole can lead to a disaster.

Air containing poisonous gases or insufficient oxygen cannot be detected until too late. Standing water absorbs many gases that can be released when the water is disturbed.

Although a mine may appear abandoned it does belong to someone and trespassing laws do apply.

Learn more at USDA Forest Service Law Enforcement and Investigations website Abandoned Mines.

VEHICLE SAFETY

Personnel taking their own vehicle or driving others in their personal vehicles are responsible for the welfare of all riders. Vehicle load limits apply and seatbelts must be available for each person. Any driver of a University vehicle, or a vehicle rented by the University, must meet the minimum age specified on the rental agreement, have a valid Texas drivers license and must follow all vehicle safety laws.

Limit night time driving. Stop if too tired to continue safely. All highway and local by-laws, rules and regulations must be strictly adhered to.

Before a trip, perform a safety check of vehicle for any damage or conditions that may need attention. Tire pressure, cooling system, belts and hoses, lights, wiper blades should be in working order.

Carry an emergency roadside kit with jumper cables, tire pressure gauge, jack/spare tire, repair tools, duct tape.

For more tips, see the US Department of Transportation site: Vehicle Checks.

PHYSICAL HAZARDS

Illness due to hot/cold climate, extreme weather conditions, chemical hazards, electrical hazards, ergonomic hazards can pose a health and safety risk when working in the field. These are all considered **Physical Hazards**.

When planning your research fieldwork, think about what kinds of physical hazards you may encounter. Make a note of physical hazards in your written safety plan. Plan to bring provisions, specialized equipment and think about what steps you will take to minimize the chances of injury due to physical hazards.

The **National Safety Council** is a great resource for information about oudoor safety. www.nsc.org

PHYSICAL HAZARD CATEGORIES

Some common physical hazards that you may encounter in the field are:

- Heat Related Illness
- Cold Related Illness
- Extreme Weather
- Electrical Hazards
- Chemical Hazards
- Ergonomic Hazards

HEAT RELATED ILLNESS

Heat Related Illness is caused by body temperature increase due to prolonged sun exposure. Dehydration, heat exhaustion, heat stroke, and sunburn are all examples of heat related illness.

If you will be working in the sun for extended periods of time, be aware of these conditions and protect yourself.

Prevention tips:

- Wear sunscreen
- Drink plenty of water
- Wear a hat
- Work in early morning hours to minimize the amount of time in direct sunlight
- Work in the shade

For more information about heat-related illness and prevention see the CDC.

COLD RELATED ILLNESS

Cold-related Illnesses include hypothermia and frostbite.

Hypothermia is cooling of body temperature to dangerous levels. This occurs when you are exposed to cold temperatures of extended period of time.

Frostbite is an injury of the skin and underlying tissues that occurs most commonly in exposed tissues such as fingers or toes.

Prevention tips:

- If working outdoors in extreme cold conditions, wear several layers of clothing to keep your core body temperature warm.
- To reduce the likelihood of frostbite in fingers or toes wear gloves and thermal socks and boots.
- Stay Dry.

For more information about Cold-related illness and prevention see the CDC.

EXTREME WEATHER

Extreme weather conditions can occur suddenly with little notice. Familiarize yourself with weather patterns of an area before going there. The National Weather Service provides forecast maps on their website.

Flash flooding, tornadoes, hail, thunder and lightning can happen while you are in the field.

In event of extreme weather, seek shelter immediately. Avoid tall trees or power poles as they can be struck by lightning. High winds can blow debris or knock limbs off of trees.

Check weather forecasts before you go into the field, especially if you will be working in areas with extreme weather conditions, such as desert areas during monsoon season.

NOAA's National Weather Service is a great resource for up to the minute forecast information.

ELECTRICAL HAZARDS

Electrical hazards are physical hazards that can be encountered out in the field.

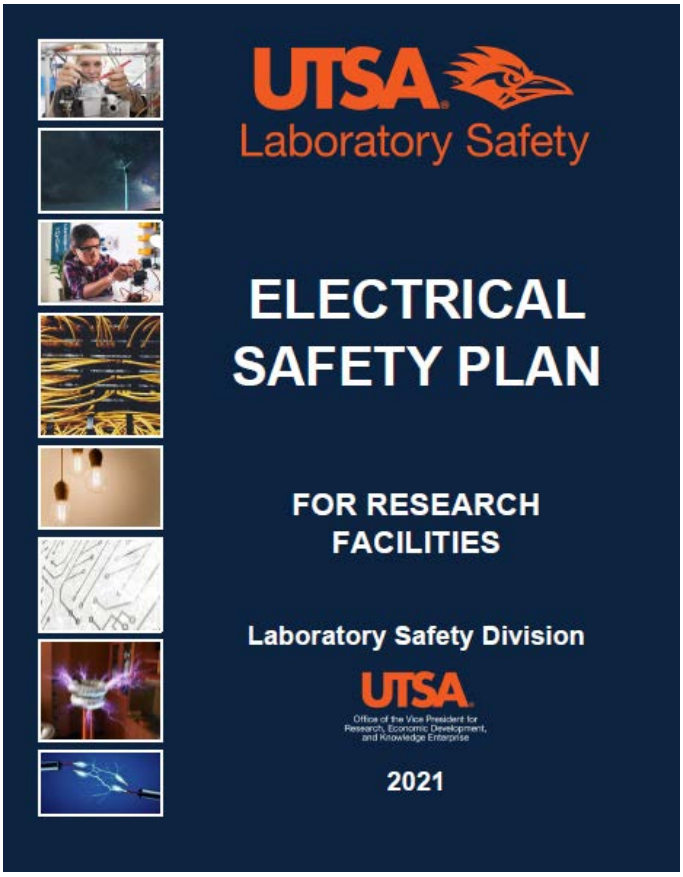
Use of equipment that is not grounded or that is damaged puts you at risk of electrical shock. Inspect equipment for damaged or frayed wires.

Make sure you are fully trained to operate electrical equipment.

Remember, electricity and water do not mix. Do not use electrical equipment near water sources. Avoid power lines. Downed power lines can still be live.

For more information about outdoor electrical safety, see **OSHA Outdoor Electrical Safety**

For more information about Electrical Hazards see the **UTSA 2021 Electrical Safety Plan**



CHEMICAL HAZARDS

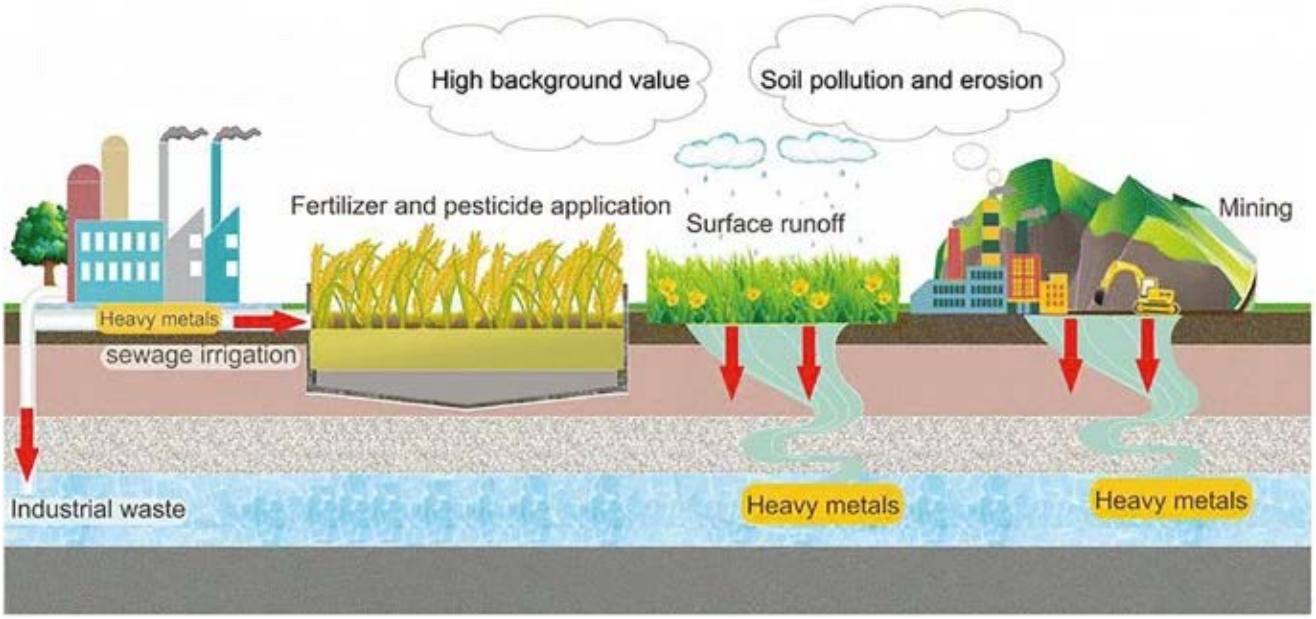
Chemical hazards in a field environment can be from chemicals you bring to the field. Try to avoid taking chemicals from the lab to work in a field site. It is much safer to take samples to the lab and process them in the lab.

However, if you have to take chemicals or analysis kits be sure to bring standard Personal Protective Equipment. Also, transport chemicals in secondary container, have SDS and know what to do in case of a spill.

For more information about chemical hazards, see the **2021 UTSA Chemical Hygiene Plan.**

Other chemical hazards are fertilizers and pesticides in agricultural fields, heavy metals in water samples, or even toxic chemical waste from industrial manufacturing.

Wear PPE such as gloves when gathering samples. Be aware that chemical hazards may be present in the soil and water.



ERGONOMIC HAZARDS

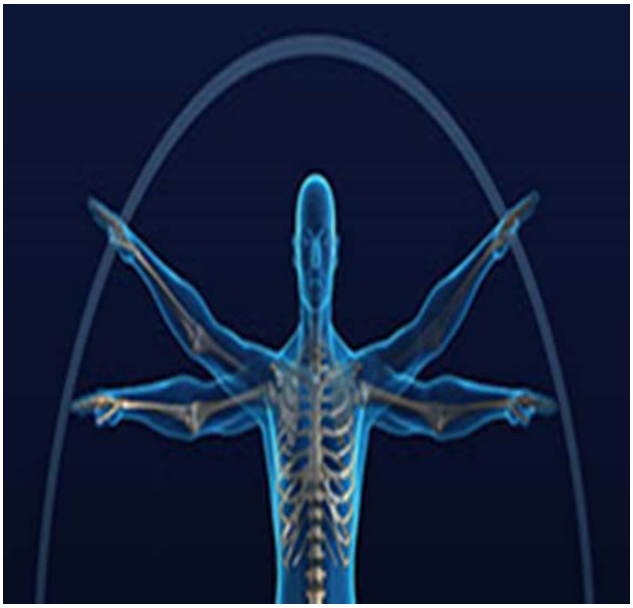
Ergonomic hazards are physical factors that can harm the musculoskeletal system. These can include repetitive motion, poor body positioning, back injuries and more. Examples of Musculoskeletal Disorders are: muscle strains, lower back injuries, trigger finger, eipcondylitis, rotator cuff injuries, tendinitis, carpal tunnel syndrome.

Before going out to the field, think about what kinds of ergonomic challenges you will face.

If you will have boxes of samples, take a rolling cart to place them on. Consider asking for help with heavy items. Take breaks if there are repetitive motions throughout the day.

If you are aware of ergonomic hazards that exist, you can find ways to reduce physical demands on your body and decrease chance of injury.

For more information on ergonomic hazards and ways to prevent injury see Occupational Safety and Health Administration (OSHA) website.



TERRAIN AND VEGETATION

Terrain refers to a land's natural and physical features such as elevation and slope. Different geographical regions have unique landforms and natural features.

Knowing what kind of terrain is in an area will be beneficial to helping you plan to work outdoors on your fieldwork assignment. You would expect to wear different clothing and pack different gear to adapt to the physical challenges of each geographical area.

To search for topography maps, you can use topoView, an interactive map tool from the US Geological Survey.

HILLS AND MOUNTAINS

Hills and Mountainous terrain can have rocks, steep areas, or high elevation. Recognize that everyone has their limits and plan a route that's appropriate for the experience, fitness and skills of the whole group.

Climbing or hiking in hazardous terrain such as steep or rocky areas can have tripping or falling hazards. Wear appropriate shoes, use hiking poles for balance, use rappelling equipment for climbing. High Altitude Sickness can occur with decreased oxygen and increased breathing rate. Allow your body to acclimate by gaining elevation slowly. For more tips on prevention of high altitude illness, see the CDC Yellow Book, Chapter 3.

Be aware that temperature drops as elevation gets higher and winds become much stronger. Carry a compass to help navigate to safety since there are no signs posted in hills and mountains. Familiarize yourself with how to use a compass before heading out on the trip. American Hiking Society is a good source for tips on compass use.

WOODED AREAS

Wooded areas have tall trees and thick underbrush due to heavy rainfall. Watch your step. Be alert for slippery areas and take your time to avoid slipping.

Low hanging branches and variable terrain make running unsafe. Leaves can hide slippery areas underneath. Log crossings can be especially dangerous. Find alternate routes across streams.

Be aware of your surroundings. Trees and branches can fall without warning due to broken limbs or tree rot.

Avoid contact with poison plants. Exposure to poison ivy, poison oak, or poison sumac plants can cause itchy rash and red, swollen skin. If a rash develops, apply a wet compress or use a topical ointment.

Hunting season is a dangerous time to be in forest areas as such terrain is a refuge for animals. Wear bright colored vest to make you visible to hunters.

DESERT AREAS

Desert areas are known for high temperatures during day and cold temperatures at night.

Minimize exposure to direct sunlight by wearing a hat or taking advantage of shaded areas to stay cool. Apply sunscreen. Even in winter months, in a desert direct sunlight can cause severe burns.

Stay out of the dehydrating rays of the sun during the day. Collect samples or conduct research activities in the cooler hours of the morning or evening. Stay hydrated by drinking water throughout the day. Monitor yourself and team members for signs of Heat Illness.

Watch out for cacti and thorny brush. Cactus needles can prick the skin and be difficult to remove. Pack tweezers or a fine-tooth plastic comb for removing needles-never use your fingers.

Never disturb any burrows you see in the ground. Venomous snakes, scorpions and spiders all call these places home.

COASTAL AREAS

Waterways such as lakes, rivers and streams have dangers that include drowning, slipping, or exposure to contaminated water.

Drowning: Wear a life vest if you can't swim. Wade in shallow water. Move cautiously, as the bottom can quickly drop off into deeper water. Swim lessons are available through the UTSA Aquatic Center, 210-458-6727.

Slipping: Wear waders or special shoes to prevent slipping. Watch out for currents or turbulent water that can knock you over.

Contaminated water: Water can be contaminated by sewage, runoff or animal waste. Wear appropriate PPE for sample collection.

Boating Safety courses are available through the Texas Parks and Wildlife.

The US Coast Guard recommends a GAR Model of Risk Assessment to evaluate the level of risk.

ELECTROFISHING

For research work involving primarily electrical hazards such as Electrofishing, CPR/First Aid is highly recommended to learn to deal with electric shock. Workers should never do ElectroFishing alone.

Safety Orientation should include NCTC Electrofishing Safety online course (CSP2202)

US Fish and Wildlife Service (USFWS) regulations 241 FW 6 provides guidelines for the safe and effective operation, construction and modification of electrofishing equipment.

All crew members must wear chest or hip waders to insulate them from electrical shock.

Prior to starting ElectroFishing activities, a safety plan should be in place, CPR should be taken and CSP2202 class should be completed.

VEGETATION

Vegetation in environment can cause different kinds of medical problems. Contact with vegetation can cause irritation to the skin. Some vegetation has thorns or thistles that can puncture the skin. Other types can release pollen into the air.

Poison Ivy and Poison Sumac are the two most common harmful plants in the field in Texas. If handled, they can cause a (sometimes severe) rash with blistering. It is important to wash your skin thoroughly if you have been exposed. Apply Antihistamines and topical lotions.

Cacti and thorny brush have sharp thistles and thorns that can pierce the skin. If you get these embedded in your skin, use tweezers to remove them.

Grass and trees release pollen into the air which can be carried by wind for miles. If you are prone to allergies, you may want to check weather report for allergens and pollen count in the area you will be working.

Wildfires threats due to droughts mean many counties have Burn Bans in effect. Be mindful of activities that may start a wildfire. For more information see Wildland Fire Management webpage.

Fieldwork involving plants and plant products brought back to campus is subject to the Plant Biosafety section of UTSA Biological Safety Plan.

WILDLIFE

Different kinds of wildlife can be encountered in the field. Some wild animals like rodents and snakes are ubiquitous, they are found in all geographical areas. Other animals, like deer are found in areas with high vegetation such as wooded areas.

Before you go into the field, research the wildlife in the area. The Texas Parks and Wildlife department is a great resource for information about wild animals. They have great tips for what to do if you encounter wildlife.

SNAKES

Snakes such as Rattlesnakes, water moccasins copperheads and coral snakes are quite common in Texas. They inhabit woody areas and tend to hide in brush.

Generally, snakes are more afraid of you than you are of them. They tend to only lash out if they are stepped on or if they think their territory or their young are at risk.

Watch where you walk and place your feet. Use a stick to disturb the brush in front of you. Wear heavy boots.

Do not approach a snake, particularly one ready to strike. Back away slowly and maintain a visual. Texas Parks and Wildlife is a great resource for more information about snakes.

The American Hiking Society has published a Snake Bite Fact sheet that you can read here.

COYOTES, FOXES, BOBCATS

Coyotes, foxes and bobcats are essential to a healthy ecosystem and are beneficial in controlling rodent populations. They have a natural fear of humans and healthy animals will not attack unless corned or provoked.

If you spot one of these in the field, maintain a visual and avoid confrontation.

These animals can contract rabies and mange. If you get bit by a sick animal, scrub any bite wound immediately and aggressively with soap and water. Use antiseptic such as betadine from your First Aid Kit.

Timely treatment after a bite is critical to prevent rabies disease. Seek treatment immediately.



FERAL HOGS

Feral hogs are a common in Texas. Their destructive and invasive nature allow them to wreak havoc in almost any climate or ecosystem in the state.

Males can grow upwards of 300 pounds and are known to be highly territorial and aggressive. Females are extremely protective of their young and will not hesitate to attack if they feel their babies are threatened.

Wild hogs are susceptible to parasites and infections and are potential carriers of disease.
In the event of an encounter with feral hogs, seek high ground such as big rocks or trees.

DEER

Deer can inhabit wide range of habitats and even live in the city.

Rut, the period of intensive breeding behavior, runs from (roughly) October to January in the Hill Country. Bucks have the potential to be more aggressive during this period of time.

Avoiding "crowding" the deer by allowing them an escape route and keeping a distance helps prevent deer attacks.

Deer are carriers of fleas and ticks that can cause disease. Wear insect repellant. Tuck pants into boots. Wear clothing of tightly woven material to minimize the chance of getting fleas and ticks on you.

PREDATORY ANIMALS

Predatory animals such as bears and mountain lions live in Texas hill country and other areas. Be aware of other predatory animals that may inhabit the areas where you will be doing field work.

Bears, mountain lions and other dangerous animals can attack if they feel threatened.
Avoid contact with these animals, especially young ones as the protective mother may be nearby.

Predatory animals have predatory instinct to chase things that move. If encountered, do not run!
Texas Parks and Wildlife is a great resource for information about terrestrial ecoregions including wildlife identification, endangered animals and Texas Regulations.

NON-HUMAN PRIMATES (NHP) WORLDWIDE

Four countries are home to two-thirds of the planets primates. Brazil, Madagascar, Indonesia, and the Democratic Republic of the Congo harbor 65% of all primate species.

Non Human Primates such as Chimpanzees and Gorillas are stronger than humans and pose a physical threat. In 2012, Andrew Oberle, A UTSA graduate student was mauled by caged chimpanzees who dragged him by the feet into their enclosure at a chimp sanctuary in South Africa.

Not only are Non Human primates stronger than humans, they also share up to 98.5% of genetic material with us. This makes sharing of zoonotic disease between the species more likely. HIV (Human Immunodeficiency Virus) owes is origins in human populations to viral jumps from chimpanzees, gorillas and other NHPs in Africa. Ebola Virus Disease (EVD) is also transmitted from NHP to humans.

BIRDS

Birds can carry diseases and ectoparasites such as mites and lice. Many diseases are airborne and can be transferred to humans by bird droppings. Some examples of transmissible bird diseases are: bird flu/avian influenza, trichomoniasis, aspergillosis, salmonellosis. Do not touch wild birds.

Some species of wild birds are subject to 50 CFR Part 15 Wild Bird Conservation Act. The US Fish and Wildlife Service has laws and regulations which are important in conservation efforts.

Wild animals can pose a significant zoonotic risk as their exposure history is unknown. Field work with, or around, animals should be risk assessed to determine appropriate PPE, practices and procedures. Use and housing of any animals transported from the field to UTSA must adhere to the LARC standards for quarantine be reviewed for zoonotic agents, and may require permits. No animals should be brought from the field to campus without IACUC approval and approval from the University Veterinarian.

ZOONOTIC DISEASES

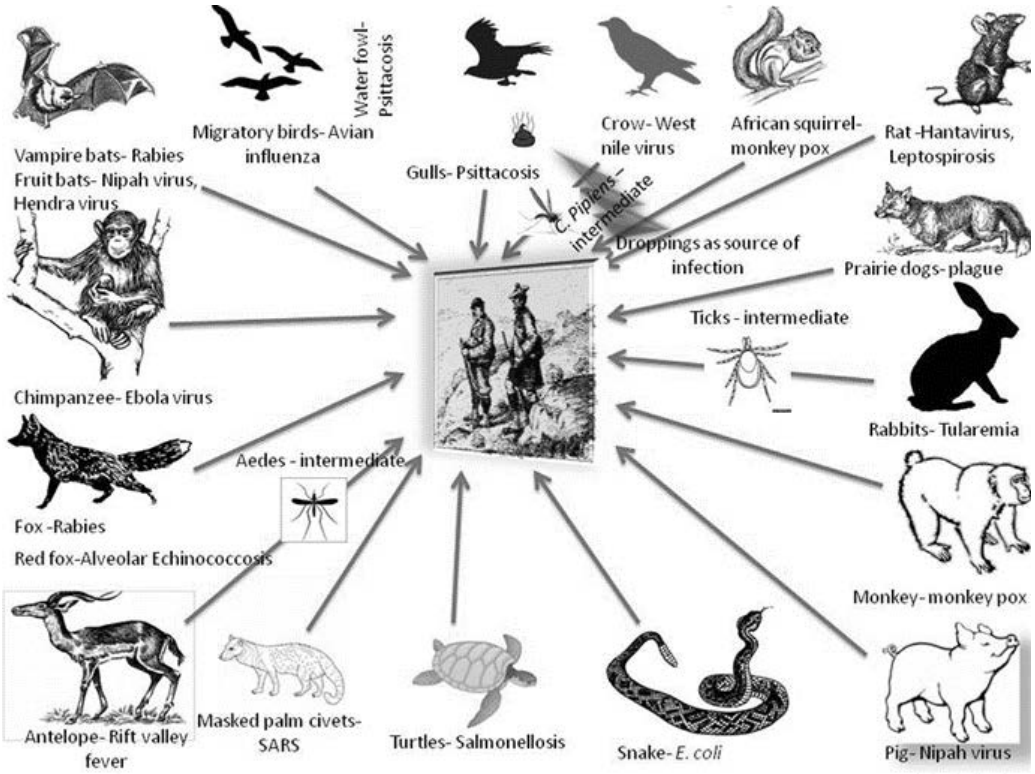
Zoonotic Disease is disease that can be transmitted from animals to humans. Disease can be transmitted directly or indirectly.

A Direct transmission can occur from bites when the infected animal's saliva gets into an open wound or mucous membranes of a human.

Indirect transmission can occur when pathogens carried by animals are spread through urine or droppings that contaminate water and soils.

Another route of indirect transmission is through mosquitos, fleas, or ticks transmit pathogens. Fleas, ticks and mosquitos are called Vectors and the source of Vector Borne Illnesses.

Field workers should exercise caution when collecting samples. Do not approach wildlife. Assume that soils and water sources are contaminated. Wear gloves. Cover skin to protect from flea, tick, mosquito bites.



RABIES

Rabies is a viral disease most often transmitted through the bite of a rabid animal. However, transmission of the virus can also occur from non-bite exposures such as scratches, abrasions, or open wounds that are exposed to saliva from a rabid animal.

Contact with infected bats is the leading cause of rabies deaths in people in the USA. Other wild animals like raccoons, skunks, and foxes can also carry rabies virus. Leave all wildlife alone.

Wash animal bites or scratches immediately with soap and water. Post-exposure prophylaxis 14-day treatment should be started by your health care provider as soon as possible after exposure.

If you are bitten or scratched by a wild animal while working in the field, you should talk to healthcare provider to determine your risk for rabies.

The CDC has more information about Rabies disease.

TOXOPLASMOSIS

Toxoplasmosis is a disease caused by the microscopic parasite Toxoplasma gondii. The disease has symptoms including muscle pain, fever and headache which can last for weeks.
Felids (cats) are the definitive host or primary reservoir species for this disease. Intermediate hosts including warm-blooded animals such as humans, bear, pigs, moose, bison, marsupials, birds and small mammals.

Transmission occurs via several routes. Infected felids shed the oocyte in feces, which can sporulate and spread in the environment and infect intermediate hosts.

Care should be taken when handling soil samples. Treat soil as contaminated. Wear gloves. Wash your hands with soap and water after handling.

The CDC has more information about Toxoplasmosis infection.

Q FEVER

Q fever is an infectious disease of animals and humans caused by bacteria called Coxiella burnettii. Sheep, goats, and cattle can carry the bacteria.
Animals that carry this organism shed it into the environment in feces, urine, milk, and in birthing fluids and membranes.

Many animals that carry the organism do not show any signs of the disease.
Wind-borne transmission of the bacteria and contact with contaminated soil or clothing are potential routes for people to become infected.

Q fever can be treated with antibiotics. Ill persons who work with sheep and goats must communicate with health care provider about any previous exposure to these animals, their facilities, bedding or manure.

The CDC has more information about Q Fever.

VECTOR-BORNE ILLNESS

Mosquitos, bees, wasps, fleas and ants are just a few of the insects that you may encounter in the field. Their bites and stings can be painful and can also carry bacteria or viruses that cause diseases.

Bring a can of insect repellant or bug spray. EPA-registered insect repellents have active ingredients such as DEET, Picaridin, IR3535). Products containing permethrin have been found to be particularly effective against many potentially harmful insects. (Do not use permethrin directly on skin).
Tucking your pants into tall socks, pulling your hair back, and avoiding areas of tall brush help prevent insects from attaching themselves to you.
After working in the field, it is important to shake out your hair and clothing and check yourself for bug bites/ticks.

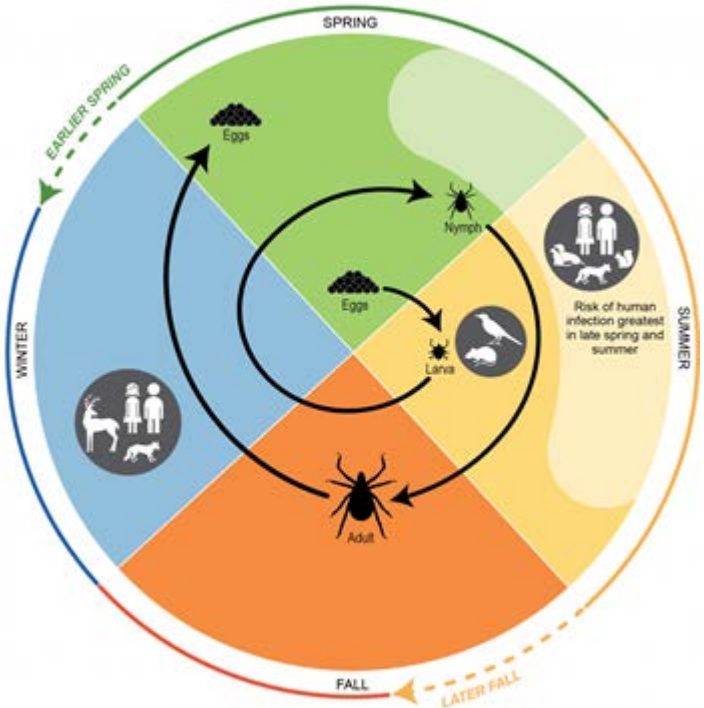
WHAT ARE VECTORS?

Vectors are living organisms that can transmit infectious diseases between humans or from animals to humans. Viruses, bacteria and parasites are transmitted by mosquitoes, ticks, fleas and other living organisms.

Some Vector-Borne Diseases are:
Chikungunya, Dengue Fever, Lyme Disease, Malaria, Plague
Rocky Mountain Spotted Fever, Tularemia, Typhus, West Nile Virus

The highest number of reported zoonotic disease cases in Texas have been due to Flea-borne (murine) Typhus and Malaria, both are vector-borne illnesses.

Field workers should take care to avoid fleas, ticks and mosquitos that can transmit disease.



FLEA-BORNE TYPHUS

Typhus fevers are a group of diseases caused by bacteria that are spread to humans by fleas, lice and chiggers.

In Texas, flea-borne (murine) typhus was the most common illness in 2019 reported by the CDC with 324 cases reported.

Flea-borne typhus is spread to people through contact with infected fleas. When an infected flea bites a person or animal, the bite breaks the skin causing a wound.

Fleas poop when they feed. The poop, called flea dirt can then be rubbed into the bite wound by scratching, causing infection.

People can also breathe in infected flea dirt or rub it into their eyes.

Precautions should be taken to minimize contact with animals such as rats, cats or opossums which may carry infected fleas.

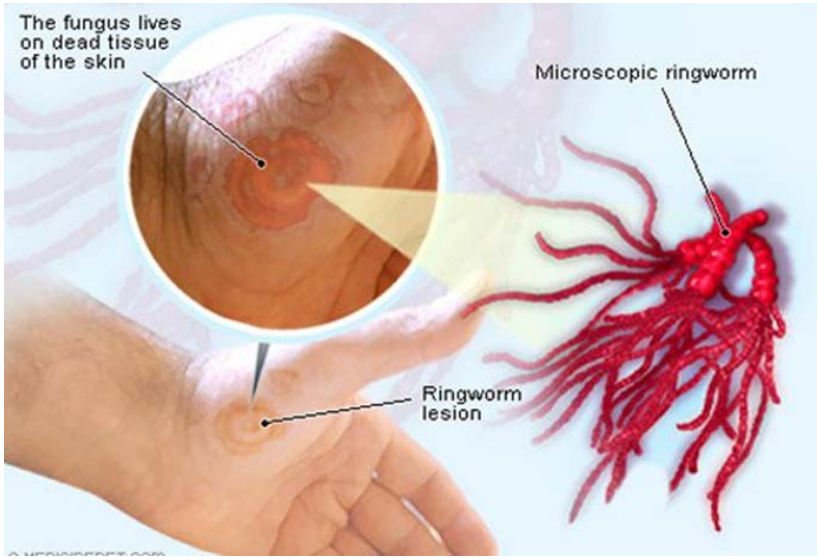
Cover exposed skin as much as possible when working in the field to minimize area that can be bit by fleas if they do jump on you.

SKIN INFECTIONS

Ringworm (Dermatophytosis) is a highly contagious fungal skin infection of the skin or scalp. Infection can occur when one is exposed to an infected animal, an infected person or spores in the environment. See CDC information page for more information.

Scabies is a skin condition that causes itching and rashes caused by a microscopic mite. It can be transmitted from infected animals to humans. Although the mites cannot reproduce in humans, they can cause a rash, which is an allergic reaction to mite's feces.

Be aware of the risk of skin infections from infected animals or people. Keep clean, wash your hands often. Stay cool and dry.



MALARIA AND INTERNATIONAL TRAVEL

Malaria is a disease spread by mosquitos carrying a parasite. It is endemic in over 100 countries. In the US, malaria was endemic before the 1950s. Mosquito control by pesticides have reduced infection rates to 1400 cases per year. Almost all of these cases are imported by travelers to endemic countries.

Travelers to areas where malaria is prevalent are advised to take mosquito avoidance measures including use of mosquito repellants, wearing protective clothing, and sleeping under an insecticide-treated bed net.

Chemoprophylaxis (anti malarial drugs) may be effective when used in conjunction with personal protective measures to avoid mosquito bites.

For more information about malaria see the CDC. Contact your healthcare provider for information about anti-malarial drugs. The **UTSA Occupational Health** clinic is available for employee medical exams, immunizations and other health-related information. Call 210-458-4038. Students can contact **UTSA Student Health Services** through the MyHealth Portal.

INTERNATIONAL TRAVEL

Before traveling internationally, pay special attention to safety and security information on the US Department of State website. US Citizen Travelers should enroll in the Smart Traveler Enrollment Program (STEP) to receive alerts and be located in an emergency.

Travel Advisory, alerts and other important details specific to the country you are visiting could affect you. Risk indicators such as Crime, Terrorism, Civil Unrest, Health, Natural Disaster, Kidnapping are tracked as levels 1-4. To read more about Travel Advisories see travel.state.gov.

The UTSA Global Initiatives Department provides information about international travel, risk and safety, UTSA partnerships and agreements. For more information about Education Abroad, email educationabroad@utsa.edu or call 210-458-7203.

Before traveling abroad, read up on the country's entry/exit requirements, local laws and customs, health conditions, vaccination requirements.

RESOURCES

On UTSA Campus Resources:

Lab Safety: Lab Safety division is available for hazard information and hazard evaluations. Call 210-458-8515 or check with your assigned laboratory safety specialist.

Occupational Health Clinic: The UTSA Occupational Health clinic is available for employee medical exams, immunizations and other health-related information. Call 210-458-4038. Students can contact UTSA Student Health Services through the MyHealth Portal.

First Aid/CPR Training: HeartSaver First aid and CPR and AED training course is available on campus. A Wilderness First Aid/Remote First Aid course is available through the UTSA Outdoor Resource Center, 210-458-6720. Outdoors@utsa.edu

Online Resources:

Center for Disease Control and Prevention (CDC): For Information about diseases and conditions and statistical information in your area. https://www.cdc.gov

US Fish and Wildlife Service: Provides information about wildlife in a geographical area. Guide and information for protecting wildlife and plant resources. https://www.fws.gov

Occupational Safety and Health Administration (OSHA): US government agency responsible for ensuring safety at work and healthful work environment. https://www.osha.gov

National Oceanic and Atmospheric Administration (NOAA): American government agency that forecasts weather, monitors oceanic and atmospheric conditions, etc. https://www.noaa.gov

American Red Cross: First Aid app on AppStore, Google Play or text GETFIRST to 90999
National Institute for Occupational Safety and Health (NIOSH) Hazards to Outdoor Workers
NOLS National Outdoor Leadership School for Wilderness and Remote first aid training.

US Forest Service Handbook: Provides safety information for general travel, motorized vehicles, aviation and watercraft, livestock, bicycles and hiking safety. https://www.fs.usda.gov

NIOSH Outdoor Safety: Covers several hazards of working outdoors including physical hazards (weather, temperature, UV), biological hazards (vector-borne diseases, wildlife/insects, poisonous plants) and others. https://www.cdc.gov/niosh/topics/outdoor/